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TITLE: DEODORIZING FILTER AND AIR CONDITIONER MOUNTING IT

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ABSTRACT:

PROBLEM TO BE SOLVED: To control deodorizing capability of an odor component by forming a structure for changing ventilating resistance in response to a state in a deodorizing filter carrying a photocatalyst.

SOLUTION: The deodorizing filter comprises a plurality of honeycomb-like adsorption materials 3a each carrying a photocatalyst on the surface, a connecting means 7 and a moving means 8. The plurality of the materials 3a are formed in a structure in which the materials 3a are approached in parallel to each other between ventilating surfaces, at least one material 3a is coupled to the means 8 through the means 7 and can be moved in parallel to the ventilating surface of the other material 3a at a predetermined distance by the means 8. Therefore, the deodorizing capability of the odor component can be controlled by arbitrarily regulating the increase or the decrease in the resistance of the material 3a.

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CLAIMS

[Claim(s)]

[Claim 1] It consists of two or more honeycomb-like adsorption material which supported the photocatalyst on the front face, a connecting means, and a migration means. Said two or more honeycomb-like adsorption material Aeration sides are parallel and approach and at least one honeycomb-like adsorption material is connected with said migration means through said connecting means. And the odor removal filter characterized by having structure which can move predetermined distance in parallel to the aeration side of the honeycomb-like adsorption material of another side with said migration means.

[Claim 2] In an interior unit, a heat exchanger, an odor removal filter, a ventilation means, and a wind back board, Two or more honeycomb-like adsorption material with which it consisted of two or more light sources which irradiate different ultraviolet-rays wavelength, and said odor removal filter supported the photocatalyst on the front face, It consists of said honeycomb-like adsorption material and support means of the same number, a connecting means, and a migration means. Said two or more honeycomb-like adsorption material is respectively supported independently from a support means. And aeration sides are parallel and approach and at least one honeycomb-like adsorption material is connected with said migration means through said connecting means. And it is the air conditioner which has the structure which can move predetermined distance in parallel to the aeration side of the honeycomb-like adsorption material of another side in accordance with a support means with said migration means, and is characterized by installing said two or more light sources in the location which can irradiate ultraviolet radiation at said odor removal filter.

[Claim 3] The absorption thermo sensor which is installed in air absorption opening of said interior unit, and detects the temperature of absorption air, The operation means which issues ON of temperature control operation of said interior unit, and the command of OFF, and a temperature control capacity change means to choose an automatic change and manual change of temperature control capacity, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Receive the signal of the temperature of the absorption air which said suction thermo sensor detected, and temperature control capacity is chosen as a multistage story. The air conditioner according to claim 2 characterized by having the 1st control unit which consists of the 1st microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means.

[Claim 4] The odor sensor which detects the odor level in the air installed in air absorption opening of said interior unit, The deodorization start-up means which issues the command of a deodorization start up, and a deodorization capacity change means to choose an automatic change and manual change of deodorization capacity, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Receive the signal of the odor level which said odor sensor detected, and deodorization capacity is chosen as a multistage story. The air conditioner according to claim 2 characterized by having the 2nd control unit which consists of the 2nd microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means.

[Claim 5] The deodorization start-up means which issues the command of a deodorization start up, and the timer means which issues the command of a halt after it measures deodorization operation time in response to the signal of a deodorization start up and predetermined time passes, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Data processing of the predetermined signal sent from said timer means is received and carried out. The air conditioner according to claim 2 characterized by having the 3rd control unit which consists of the 3rd microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the air conditioner which carried the odor removal filter and it which remove pollutants, such as a stinking component in air, using a photocatalyst.

[0002]

[Description of the Prior Art] In recent years, in dwelling space, the cure to the indoor air contamination by organic substances, such as an volatile organic substance (VOC) which is generated from building materials, finishing material, etc. in a new-building residence in addition to deodorization of life smells, such as a cigarette and a toilet, attracts attention. Moreover, big interests have gathered also to antibacterial [which is represented by hospital infection problems, such as MRSA, / indoor]. As one of the means to antibacterial [these / deodorization or antibacterial], the photocatalyst which discovers the powerful oxidative degradation effectiveness by the exposure of light is used.

[0003] As a conventional air conditioner which used the effectiveness of a photocatalyst for the deodorization application, there are some which are shown, for example in JP,1-234729,A.

[0004] Explanation about the above-mentioned conventional air conditioner is given referring to a drawing below.

[0005] Drawing 12 is the sectional view of the interior unit of the conventional air conditioner. Moreover, drawing 13 is the front view of the conventional odor removal filter. Furthermore, drawing 14 is an expanded sectional view of a part which makes the deodorization function of the conventional odor removal filter discover.

[0006] In drawing 12 , drawing 13 , and drawing 14 , inside, 1 is the interior unit of an air conditioner, it has the light source 6 which irradiates a heat exchanger 2, an odor removal filter 3, the ventilation means 4, the wind back board 5, and ultraviolet rays, and an odor removal filter 3 is installed in the tooth back of a heat exchanger 2, and the light source 6 is installed in the location which can irradiate ultraviolet rays at an odor removal filter 3.

[0007] The odor removal filter 3 has structure which has the structure which supported photocatalyst 3c to the front face of honeycomb-like adsorption material 3a, and pore 3b, and wrapped honeycomb-like adsorption material 3a in 3d of sponge-like shock absorbing material for the breakage prevention to the impact of a deodorant 3, as shown in drawing 13 and drawing 14 .

[0008] Activated carbon, the zeolite, the porosity ceramic, etc. are used as an ingredient of honeycomb-like adsorption material 3a.

[0009] Moreover, although it is possible as an ingredient of photocatalyst 3c to use an anatase mold titanium dioxide (TiO₂), a zinc oxide (ZnO), a tungstic trioxide (WO₃), etc., this inside or a titanium dioxide can demonstrate deodorization function sufficient also by weak ultraviolet rays, and is desirable from offensive odors, such as the wide range matter, for example, ammonia, an acetaldehyde, an acetic acid, a trimethylamine, methyl mercaptan, a hydrogen sulfide, styrene, a methyl sulfide, 2 methyls thioether, and an isovaleric acid, being removable.

[0010] Furthermore, photocatalyst 3c can also be supported by immersing honeycomb adsorption material 3a into the titanium-dioxide system solution formed in the shape of a sol, and subsequently making it dry.

[0011] About the air conditioner which consists of the above configurations, the actuation is explained below.

[0012] As shown in the arrow head of drawing 12 , indoor air is attracted from the upper part of an interior unit 1, and is again breathed out indoors through a heat exchanger 2, an odor removal filter 3, and a blower 4. The light source 6 irradiates ultraviolet rays in order to make the deodorization effectiveness of an odor removal filter 3 that photocatalyst 3c was supported discover.

[0013] If ultraviolet rays are irradiated by the light source 6 at photocatalyst 3c on an odor removal filter 3, the electron hole generated on the front face of photocatalyst 3c reacts with the water of adsorption of a photocatalyst 3c front face, Radical OH (hydrogen radical radical) is generated, when this radical OH cuts the molecular binding of the organic substance, oxidative degradation of the odor components, such as ammonia, can be carried out, and they can carry out

non-bromination.

[0014] It will be gradually decomposed by photocatalyst after being decomposed by photocatalyst 3c before what is easy to be decomposed among odor components when air which contained odor component here is inhaled in interior unit 1 and it passes odor filter 3 is adsorbed by honeycomb-like adsorption material 3a, and odor component's late [of catabolic rate] carrying out end adsorption at honeycomb-like adsorption material 3a and accumulating 3c.

[0015] In order that honeycomb-like adsorption material 3a which constitutes the deodorization filter 3 as mentioned above may perform oxidative degradation of adsorbate and may perform removal from an adsorption front face by exciting photocatalyst 3c by the UV irradiation from the light source 6, it defecates, the fall of the adsorption capacity force is prevented, and an adsorption front face can always save the deodorization effectiveness for a long period of time. Furthermore, by the change in the blast weight of the ventilation means 4, deodorization capacity can be adjusted by changing the contact probability of the odor component in air, and an odor removal filter 3.

[0016]

[Problem(s) to be Solved by the Invention] However, although deodorization capacity has the highly large contact probability of the odor component and odor removal filter 3 which are contained in air when the ventilation resistance of an odor removal filter 3 is fixed, and there is much blast weight although the above-mentioned conventional configuration adjusts deodorization capacity by the change in the blast weight of the ventilation means 4, since the contact probability of an odor component and an odor removal filter 3 becomes low when there is little blast weight, deodorization capacity declines. For this reason, where living environment is maintained at sufficiently comfortable temperature, when many odor components existed and blast weight was increased in order to enlarge deodorization capacity, there was a fault of spoiling the amenity in a temperature side.

[0017] That is, the above-mentioned conventional configuration had the fault that the direct adjustment of the deodorization capacity of the honeycomb-like adsorption material 3a itself which supported photocatalyst 3c could not be carried out.

[0018] This invention solves the conventional technical problem and it aims at offering the odor removal filter which can adjust the change in the ventilation resistance of honeycomb-like adsorption material to arbitration, and can control deodorization capacity.

[0019] Moreover, this invention solves the conventional technical problem, and it has the deodorization filter which can adjust the change in ventilation resistance to arbitration, and aims at offering the air conditioner which can control deodorization capacity.

[0020] Moreover, other purposes of this invention are offering the air conditioner which can use properly temperature control operation of amenity serious consideration, and deodorization operation which thought the nature purification of air as important according to a resident's purpose, and can maintain temperature control capacity and deodorization capacity with a sufficient precision on high level according to the dirt degree of indoor temperature or air.

[0021] Furthermore, other purposes of this invention are performing deodorization operation by timer control, and aim at offering the air conditioner which it is efficient and can perform purification actuation of the quality of air by low cost.

[0022] Moreover, since, as for the above-mentioned conventional configuration, the light source 6 always irradiates the ultraviolet rays of fixed wavelength at photocatalyst 3c currently supported by the odor removal filter 3, even when air is not dirty, the ultraviolet rays of superfluous energy level will be irradiated by photocatalyst 3c. In this case, although the electron and electron hole which were excited by the high consistency had occurred on the photocatalyst 3c front face, since there were few odor components, there was little consumption of an electron hole, the probability of the electron in the condition that that part consistency is high, and the recombination of an electron hole became large, and the fault that the oxidative degradation effectiveness over odorant fell as a result existed.

[0023] It aims at offering the air conditioner which can rationalize the incidence rate of the electron hole of a photocatalyst by this invention's solving the conventional technical problem and using properly the exposure wavelength of two or more light sources which irradiate different ultraviolet-rays wavelength according to the odor level in air.

[0024]

[Means for Solving the Problem] In order to attain this purpose, this invention consists of two or more honeycomb-like adsorption material which supported the photocatalyst on the front face, a connecting means, and a migration means. Said two or more honeycomb-like adsorption material Aeration sides are parallel and approach and at least one honeycomb-like adsorption material is connected with said migration means through said connecting means. And since it has structure which can move predetermined distance in parallel to the aeration side of the honeycomb-like adsorption material of another side with said migration means, deodorization capacity is controllable.

[0025] This invention in an interior unit Moreover, a heat exchanger, an odor removal filter, and a ventilation means,

wind direction -- consisting of a plate and two or more light sources which irradiate different ultraviolet-rays wavelength, said odor removal filter with two or more honeycomb-like adsorption material which supported the photocatalyst on the front face It consists of said honeycomb-like adsorption material and support means of the same number, a connecting means, and a migration means. Said two or more honeycomb-like adsorption material is respectively supported independently from a support means. And aeration sides are parallel and approach and at least one honeycomb-like adsorption material is connected with said migration means through said connecting means. And since it has the structure which can move predetermined distance in parallel to the aeration side of the honeycomb-like adsorption material of another side in accordance with a support means with said migration means and said two or more light sources are installed in the location which can irradiate ultraviolet radiation at said odor removal filter The deodorization capacity over an odor component can be controlled and the bacteria in air can be sterilized further directly.

[0026] Furthermore, the absorption thermo sensor which this invention is installed in air absorption opening of said interior unit, and detects the temperature of absorption air, The operation means which issues ON of temperature control operation of said interior unit, and the command of OFF, and a temperature control capacity change means to choose an automatic change and manual change of temperature control capacity, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Receive the signal of the temperature of the absorption air which said suction thermo sensor detected, and temperature control capacity is chosen as a multistage story. Since it has the 1st control unit which consists of the 1st microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means, deodorization capacity is also securable, giving priority to the amenity.

[0027] Furthermore, the odor sensor which detects the odor level in the air with which this invention was installed in air absorption opening of said interior unit, The deodorization start-up means which issues the command of a deodorization start up, and a deodorization capacity change means to choose an automatic change and manual change of deodorization capacity, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Receive the signal of the odor level which said odor sensor detected, and deodorization capacity is chosen as a multistage story. Since it has the 2nd control unit which consists of the 2nd microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means, operation which thought deodorization as important according to liking of a resident can be efficiently carried out with a sufficient precision.

[0028] Furthermore, a deodorization start-up means by which this invention issues the command of an odor start up, The timer means which issues the command of a halt after it measures deodorization operation time in response to the signal of a deodorization start up and predetermined time passes, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Data processing of the predetermined signal sent from said timer means is received and carried out. Since it has the 3rd control unit which consists of the 3rd microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means, low cost-ization is realizable by efficient deodorization operation and controlling deodorization operation, without using a sensor etc.

[0029]

[Embodiment of the Invention] Invention of this invention according to claim 1 consists of two or more honeycomb-like adsorption material which supported the photocatalyst on the front face, a connecting means, and a migration means. Said two or more honeycomb-like adsorption material Aeration sides are parallel and approach and at least one honeycomb-like adsorption material is connected with said migration means through said connecting means. And it has structure which can move predetermined distance in parallel to the aeration side of the honeycomb-like adsorption material of another side with said migration means, and has an operation that the deodorization capacity over an odor component is controllable by adjusting the change in the ventilation resistance of honeycomb-like adsorption material to arbitration.

[0030] Invention according to claim 2 in an interior unit A heat exchanger and an odor removal filter, Two or more honeycomb-like adsorption material with which it consisted of a ventilation means, a wind back board, and two or more light sources that irradiate different ultraviolet-rays wavelength, and said odor removal filter supported the photocatalyst on the front face, It consists of said honeycomb-like adsorption material and support means of the same number, a connecting means, and a migration means. Said two or more honeycomb-like adsorption material is respectively supported independently from a support means. And aeration sides are parallel and approach and at least one honeycomb-like adsorption material is connected with said migration means through said connecting means. And it has the structure which can move predetermined distance in parallel to the aeration side of the honeycomb-like

adsorption material of another side in accordance with a support means with said migration means. Said two or more light sources are installed in the location which can irradiate ultraviolet radiation at said odor removal filter. The deodorization capacity over an odor component can be controlled by adjusting the change in the ventilation resistance of an odor removal filter to arbitration, and adjusting the exposure wavelength of the light source to arbitration, and it has an operation that the direct sterilization of the bacteria in air can be carried out by using the light source with still shorter wavelength.

[0031] The absorption thermo sensor which invention according to claim 3 is installed in air absorption opening of said interior unit in invention according to claim 2, and detects the temperature of absorption air, The operation means which issues ON of temperature control operation of said interior unit, and the command of OFF, and a temperature control capacity change means to choose an automatic change and manual change of temperature control capacity, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Receive the signal of the temperature of the absorption air which said suction thermo sensor detected, and temperature control capacity is chosen as a multistage story. It has the 1st control unit which consists of the 1st microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means. Here When performing operation which gave priority to temperature control capacity in the environment in which the odor component existed and a resident chooses the automatic change of temperature control capacity with a temperature control capacity change means, said 1st microcomputer It absorbs, the detected signal which is temperature is received from said suction thermo sensor, data processing is performed based on the temperature data, and temperature control capacity is determined as a multistage story.

[0032] According to weakness, a predetermined actuating signal is transmitted the strength of temperature control capacity to said motorised means, said migration means, and said lighting control means.

[0033] When temperature control capacity is strength, in order to make blast weight into strength, to make ventilation resistance into smallness, in order to make habitation space into comfortable temperature promptly, and to deodorize, two or more light sources are turned on and the decomposition capacity of a photocatalyst is raised.

[0034] Since it is secured, in order that blast weight may be made into weakness and an inflow air content may deodorize few part odor components efficiently, the amenity in the temperature side of habitation space raises a contact probability by making ventilation resistance into size, and in the case of temperature control capacity weakness, it is turning on further two or more light sources, and it raises the decomposition capacity of a photocatalyst.

[0035] It has an operation that deodorization capacity is also securable, giving priority to the amenity as mentioned above.

[0036] The odor sensor by which invention according to claim 4 detects the odor level in the air installed in air absorption opening of said interior unit in invention according to claim 2, The deodorization start-up means which issues the command of a deodorization start up, and a deodorization capacity change means to choose an automatic change and manual change of deodorization capacity, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Receive the signal of the odor level which said odor sensor detected, and deodorization capacity is chosen as a multistage story. It has the 2nd control unit which consists of the 2nd microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means. Here If a resident starts deodorization operation with said deodorization start-up means and chooses the automatic change of deodorization capacity with a deodorization capacity change means further when performing operation which gave priority to temperature control capacity in the environment in which the odor component existed Said 2nd microcomputer receives the signal of the odor level in the detected air from said odor sensor, performs data processing based on the data of the odor level, and determines the optimal deodorization capacity. According to weakness, a predetermined actuating signal is transmitted the strength of deodorization capacity to said motorised means, said migration means, and said lighting control means.

[0037] When deodorization capacity is strength, in order to remove the odor component of habitation space promptly, the rate of prehension of an odor component is raised by making ventilation resistance into size, making blast weight as strength, and two or more light sources are turned on and the separative power of a photocatalyst is raised.

[0038] In the case of deodorization capacity weakness, the electron hole of a photocatalyst and the electronic probability of occurrence are lowered, and it enables it to decompose them efficiently to low odor level by turning on the light source which makes blast weight weakness, makes ventilation resistance smallness since odor level is low, and irradiates ultraviolet rays with long wavelength out of two or more light sources.

[0039] It has an operation that operation which thought deodorization as important according to liking of a resident as mentioned above can be efficiently carried out with a sufficient precision.

[0040] A deodorization start-up means by which invention according to claim 5 issues the command of a deodorization start up in invention according to claim 2, The timer means which issues the command of a halt after it measures deodorization operation time in response to the signal of a deodorization start up and predetermined time passes, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Data processing of the predetermined signal sent from said timer means is received and carried out. It has the 3rd control unit which consists of the 3rd microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means. Here When performing operation which gave priority to deodorization capacity in the environment in which the odor component existed, a resident If deodorization operation is started with said deodorization start-up means, while a timer means will start measurement of deodorization start-up time amount in response to the signal of a start up, the 3rd microcomputer An actuating signal is transmitted so that deodorization capacity may become strength, the rate of prehension of an odor component is raised by making ventilation resistance into size, making blast weight as strength, and two or more light sources are turned on and the decomposition capacity of a photocatalyst is raised.

[0041] If the execution time of deodorization operation of the predetermined time set as the timer means exceeds, the stop signal of deodorization operation will be taken out and it will change to the usual temperature control operation. It has an operation that low cost-ization is realizable by deodorization operation efficient as mentioned above and controlling deodorization operation, without using a sensor etc.

[0042]

[Example] Hereafter, the example of the air conditioner which carried the odor removal filter and it by this invention is explained, referring to a drawing. In addition, about the same configuration as the former, the same sign is attached and detailed explanation is omitted.

[0043] In addition, at least one sort in the group which serves as a photocatalyst shown by this invention from a titanium dioxide, a zinc oxide, tin oxide, a zirconium dioxide, tungstic oxide, ferrous oxide, strontium titanate, and barium titanate is used as a constituent. This inside or a titanium dioxide is more desirable than the point that deodorization function sufficient also by weak ultraviolet rays can be demonstrated.

[0044] Moreover, as a class of ultraviolet-rays wavelength shown in this invention, the wavelength of 245nm used as germicidal lamp glass and the wavelength of 365nm used as the black light are typical, and it is desirable to use both for coincidence. However, the ultraviolet rays shown in this invention are not restricted to said wavelength, and if they are 400nm or less in wavelength, even if the fluorescent lamp which irradiates the ultraviolet rays of an amount a little satisfactory also about the light source to be used will be used for them, they are not cared about.

[0045] (Example 1) Drawing 1 is the front view of the odor removal filter by the example 1 of this invention. Drawing 2 is a front view at the time of making the ventilation resistance of the odor removal filter of this example increase.

[0046] In drawing 1 and drawing 2, 7 is a connecting means, 8 is a migration means and at least one honeycomb-like adsorption material 3a is connected with the migration means 8 through the connecting means 7 among two or more honeycomb-like adsorption material 3a which supported photocatalyst 3c. Moreover, two or more honeycomb-like adsorption material 3 is taken as the condition that aeration sides were parallel and approached. A connecting means 7 does not have slack to honeycomb-like adsorption material 3a and the migration means 8, and is certainly being fixed. Electromagnetic means, such as a solenoid, can be used for the migration means 8. Moreover, when a means by which the rotation flexible actuation using a motor can adjust migration length on a stepless story is used, in addition, it is more desirable than the point which can tune finely.

[0047] About the odor removal filter constituted as mentioned above, the actuation is explained below.

[0048] Although the ventilation resistance seen from the aeration side is equivalent to single honeycomb-like adsorption material 3a when two or more honeycomb-like adsorption material 3a which supported photocatalyst 3c has lapped completely in accordance with the configuration When operating the migration means 8, honeycomb-like adsorption material 3a Since it will be in the condition that the aeration sides of honeycomb-like adsorption material 3a shifted, as [show / in drawing 2 / move in parallel to the aeration side of other honeycomb-like adsorption material 3a, and], ventilation resistance can increase sharply and can raise deodorization capacity.

[0049] The odor removal filter of this example consists of two or more honeycomb-like adsorption material 3a which supported photocatalyst 3c on the front face, a connecting means 7, and a migration means 8 as mentioned above. Two or more honeycomb-like adsorption material 3a Aeration sides are parallel and approach and at least one honeycomb-like adsorption material 3a is connected with the migration means 8 through the connecting means 7. And since it has structure which can move predetermined distance in parallel to the aeration side of honeycomb-like adsorption material 3a of another side with the migration means 8, it has an operation that the deodorization capacity over an odor component is controllable by adjusting the change in the ventilation resistance of honeycomb-like adsorption material 3a to arbitration.

[0050] (Example 2) Drawing 3 is the sectional view of the interior unit of the air conditioner by the example 2 of this invention. Drawing 4 is the front view of the odor removal filter of this example, and drawing 5 is a front view at the time of making the ventilation resistance of the odor removal filter of this example increase.

[0051] In drawing 3, drawing 4, and drawing 5, 6 is the light source and two or more light sources 6 which irradiate different ultraviolet-rays wavelength are installed. As a class of ultraviolet-rays wavelength which the light source 6 irradiates, the wavelength of 245nm used as germicidal lamp glass and the wavelength of 365nm used as the black light are typical, and it is desirable to use both for coincidence. However, the ultraviolet rays shown in this example are not restricted to the above-mentioned wavelength, and if they are 400nm or less in wavelength, even if the fluorescent lamp which irradiates the ultraviolet rays of an amount a little satisfactory also about the light source 6 to be used will be used for them, they are not cared about.

[0052] 9 is an odor removal filter and the odor removal filter 9 consists of two or more honeycomb-like adsorption material 3a which supported photocatalyst 3c on the front face, honeycomb-like adsorption material 3a, a support means 10 of the same number, a connecting means 7, and a migration means 8. The odor removal filter 9 is installed in the interior unit 1 by the support means 10. Moreover, two or more light sources 6 are installed in the location which can irradiate ultraviolet radiation at an odor removal filter 9.

[0053] About the air conditioner constituted as mentioned above, the actuation is explained below.

[0054] Although the ventilation resistance seen from the aeration side is equivalent to single honeycomb-like adsorption material 3a when two or more honeycomb-like adsorption material 3a which supported photocatalyst 3c has lapped completely in accordance with the configuration When operating the migration means 8, honeycomb-like adsorption material 3a Since it will be in the condition that the aeration sides of honeycomb-like adsorption material 3a shifted, to the aeration side of other honeycomb-like adsorption material 3a as [show / in drawing 5 / in accordance with a support means 9, move in parallel, and], ventilation resistance can increase sharply and can raise deodorization capacity.

[0055] Moreover, the bacteria in air can be directly sterilized by being able to maintain the decomposition effectiveness of photocatalyst 3c with a high level, and being able to raise deodorization capacity further, and using the light source 6 of short wavelength by adjusting combining the wavelength which two or more light sources irradiate.

[0056] The air conditioner of this example in an interior unit 1 as mentioned above A heat exchanger 2, Two or more honeycomb-like adsorption material 3a with which it consisted of an odor removal filter 9, the ventilation means 4, a wind back board 5, and two or more light sources 6 that irradiate different ultraviolet-rays wavelength, and the odor removal filter 9 supported photocatalyst 3c on the front face, It consists of honeycomb-like adsorption material 3a, the support means 10 of the same number, a connecting means 7, and a migration means 8. Two or more honeycomb-like adsorption material 3a is respectively supported independently from a support means 10. And aeration sides are parallel and approach and at least one honeycomb-like adsorption material 3a is connected with the migration means 8 through the connecting means 7. And since it has the structure which can move predetermined distance in parallel to the aeration side of honeycomb-like adsorption material 3a of another side in accordance with a support means 10 with the migration means 8 and two or more light sources 6 are installed in the location which can irradiate ultraviolet radiation at an odor removal filter 9, The deodorization capacity over an odor component is controllable by adjusting the change in the ventilation resistance of an odor removal filter 9 to arbitration, and adjusting the exposure wavelength of the light source 6 to arbitration. Moreover, the bacteria in air can be directly sterilized by using the light source 6 with short wavelength.

[0057] (Example 3) Drawing 6 is the functional block diagram of the air conditioner by the example 3 of this invention. Drawing 7 is a flow chart which shows actuation of this example.

[0058] In drawing 6, S1 is an absorption thermo sensor, is installed in air absorption opening of an interior unit 1, and detects the temperature of the air inhaled. As a thermo sensor to be used, it is desirable from a cost side and a precision side to use a thermistor method etc., for example.

[0059] Cnt1 is the 1st control unit which consists of an operation means 11, the temperature control capacity change means 12, the lighting control means 13 and the motorised means 14, and the 1st microcomputer 15.

[0060] The 1st microcomputer 15 receives the signal of the temperature of the absorption air which the absorption thermo sensor S1 detected, chooses temperature control capacity as a multistage story, and transmits a predetermined actuating signal to the lighting control means 13, the motorised control means 14, and the migration means 8. Moreover, when the migration means 8 is ON, honeycomb-like adsorption material 3a moves, and honeycomb-like adsorption material 3a does not move [the ventilation resistance of an odor removal filter 9] at the time of a large next door and OFF, but ventilation resistance serves as smallness.

[0061] The operation means 11 issues ON of temperature control operation of an interior unit, and the command of OFF. Whenever a resident inputs the temperature control capacity change means 12, it takes out the command signal of

weakness automatic and strength, and it can choose an automatic change and manual change of temperature control capacity. In an automatic case, the absorption thermo sensor S1 or detected temperature control operation which absorbs and chooses temperature control capacity automatically based on the temperature of air is performed. Moreover, the manual selection of temperature control capacity according to liking of a resident is possible by choosing weakness strength.

[0062] The lighting control means 12 controls the combination of lighting of two or more light sources 6 which irradiate different ultraviolet rays, and adjusts the wavelength to irradiate.

[0063] The motorised control means 14 controls the motor rotational frequency of the ventilation means 4, and adjusts blast weight to the multistage story of weakness strength.

[0064] About the air conditioner constituted as mentioned above, the actuation is explained based on the flow chart of drawing 7 below.

[0065] When performing operation which gave priority to temperature control capacity in the environment in which the odor component existed, first, in step 1, a resident transmits the signal of the start up of an interior unit 1 to the 1st microcomputer with the operation means 11, and starts temperature control operation.

[0066] Then, in step 2, a resident chooses the automatic change of temperature control capacity, and a manual change with the temperature control capacity change means 12. When an automatic change is chosen, in step 3, the absorption temperature detected with the absorption thermo sensor S1 is first inputted into the 1st microcomputer 15.

[0067] The actuating signal corresponding to the temperature control capacity which absorbed, performed the comparison test of the temperature and the predetermined temperature set up beforehand which the 1st microcomputer 15 detected in step 4, determined temperature control capacity strength in two steps of weakness, and was determined in step 5 is transmitted to the motorised means 14, the lighting control means 13, and the migration means 8.

[0068] Moreover, when a manual change is chosen at step 2, the manual selection of a resident's favorite temperature control capacity can be carried out at step 5.

[0069] In order for the ventilation resistance of the deodorization filter 9 to make strength and the migration means 8 smallness in OFF at step 6 in the blast weight of the ventilation means 4 in order to make habitation space into comfortable temperature promptly, when the signal of strength is transmitted at step 5, and to deodorize, the lighting control means 13 turns on two or more light sources 6, and raises the decomposition capacity of photocatalyst 3c.

[0070] In order that blast weight of the ventilation means 4 may be made into weakness at step 7 and an inflow air content may deodorize few part odor components efficiently since the amenity in the temperature side of habitation space is secured when the signal of weakness is transmitted at step 5 The migration means 8 raises a connection probability by making ventilation resistance of the deodorization filter 9 into size by ON, is turning on further two or more light sources 6, and raises the decomposition capacity of a photocatalyst.

[0071] The absorption thermo sensor S1 which the air conditioner of this example is installed in air absorption opening of an interior unit 1, and detects the temperature of absorption air as mentioned above, The operation means 11 which issues ON of temperature control operation of an interior unit, and the command of OFF, and a temperature control capacity change means 12 to choose an automatic change and manual change of temperature control capacity, The lighting control means 13 which controls ON of two or more light sources 6, and OFF, and the motorised control means 14 which adjusts the airflow of a ventilation means, Receive the signal of the temperature of the absorption air which the suction thermo sensor S1 detected, and temperature control capacity is chosen as a multistage story. It has the 1st control unit Cnt1 which consists of the 1st microcomputer 15 which transmits a predetermined actuating signal to the lighting control means 13, the motorised control means 14, and the migration means 8. If a resident chooses the automatic change of temperature control capacity with the temperature control capacity change means 12, the 1st microcomputer 15 will receive the signal of the detected absorption temperature from said suction thermo sensor S1, will perform data processing based on the temperature data, and will determine temperature control capacity as a multistage story.

[0072] According to weakness, a predetermined actuating signal is transmitted the strength of temperature control capacity to said motorised means 14, said migration means 8, and said lighting control means 13.

[0073] When temperature control capacity is strength, in order to make blast weight into strength, to make ventilation resistance into smallness, in order to make habitation space into comfortable temperature promptly, and to deodorize, two or more light sources 6 are turned on, and the decomposition capacity of photocatalyst 3c is raised.

[0074] In the case of temperature control capacity weakness, since the amenity in the temperature side of habitation space is secured, in order that blast weight may be made into weakness and an inflow air content may deodorize few part odor components efficiently, a contact probability is raised by making ventilation resistance into size, it is turning on further two or more light sources 6, and deodorization capacity is also securable [giving priority to the amenity since the decomposition capacity of photocatalyst 3c is raised].

[0075] Moreover, the bacteria in air can also be directly sterilized according to the light source 6 of short wavelength.

[0076] (Example 4) Drawing 8 is the functional block diagram of the air conditioner by the example 4 of this invention. Drawing 9 is a flow chart which shows actuation of this example.

[0077] In drawing 8, S2 is an odor sensor, is installed in air absorption opening of an interior unit 1, and detects the odor level in the air inhaled. When using an interior unit 1 in habitation space, as for the detection sensor S2, it is desirable to use the sensor which makes applicable to detection the ammonia which exists comparatively mostly, the acetaldehyde which is the odor component of a cigarette smell, an acetic acid, etc.

[0078] Cnt2 is the 2nd control unit which consists of a deodorization start-up means 16, the deodorization capacity change means 17, the lighting control means 13 and the motorised means 14, and the 2nd microcomputer 18.

[0079] The 2nd microcomputer 18 receives the signal of the odor level in the absorption air which the odor sensor S2 detected, chooses odor capacity as a multistage story, and transmits a predetermined actuating signal to the lighting control means 13, the motorised control means 14, and said migration means 8.

[0080] The deodorization start-up means 16 issues the command to which an interior unit starts deodorization operation during temperature control operation. Moreover, in case deodorization operation is suspended, it can return to temperature control operation in inputting the temperature control operation change means 12.

[0081] Whenever a resident inputs the deodorization capacity change means 17, it takes out the command signal of weakness automatic and strength, and it can choose an automatic change and manual change of deodorization capacity. In an automatic case, deodorization operation which the odor sensor S2 detected and which absorbs and chooses deodorization capacity automatically based on the odor level in air is performed. Moreover, manual selection of the deodorization capacity according to liking of a resident by choosing weakness is possible strength.

[0082] This example adds the odor sensor S2 and the 2nd control unit Cnt2 to the air conditioner of claim 3.

[0083] About the air conditioner constituted as mentioned above, the actuation is explained based on the flow chart of drawing 9 below.

[0084] When performing operation which gave priority to deodorization capacity in the environment in which the odor component existed, as for a resident, in step 8, temperature control operation of an interior unit 1 is first started with the operation means 11. Then, in step 9, the signal of the deodorization start up of an interior unit 1 is transmitted to the 2nd microcomputer with the deodorization start-up means 16, and deodorization operation is started.

[0085] Furthermore, in step 10, a resident chooses the automatic change of deodorization capacity, and a manual change with the deodorization capacity change means 17.

[0086] When an automatic change is chosen, in step 11, the odor level detected by the odor sensor S2 is first inputted into the 2nd microcomputer 18.

[0087] The actuating signal corresponding to the deodorization capacity which performed the comparison test of the odor level which the 2nd microcomputer 18 detected in step 12, and the predetermined odor level set up beforehand, determined deodorization capacity strength in two steps of weakness, and was determined in step 13 is transmitted to the motorised means 14, the lighting control means 13, and the migration means 8.

[0088] Moreover, when a manual change is chosen at step 10, the manual selection of a resident's favorite deodorization capacity can be carried out at step 13.

[0089] As for the blast weight of the ventilation means 4, it is step 14, and when the signal of strength is transmitted at step 13, in order to remove the odor component of habitation space promptly, strength, the ventilation resistance of the deodorization filter 9 raises the rate of prehension of an odor component as a size by ON, and the migration means 8 turns on two or more light sources 6, and raises the decomposition capacity of photocatalyst 3c.

[0090] When the signal of weakness is transmitted at step 13, the electron hole of a photocatalyst and the electronic probability of occurrence are lowered, and it enables it to decompose efficiently to low odor level by turning on the light source 6 which blast weight of the ventilation means 4 is made into weakness at step 15 since odor level is low, the migration means 8 makes ventilation resistance of the deodorization filter 9 smallness in OFF, and irradiates ultraviolet rays with long wavelength out of two or more light sources 6.

[0091] The odor sensor S2 which detects the odor level in the air with which the air conditioner of this example was installed in air absorption opening of an interior unit 1 as mentioned above, The deodorization start-up means 16 which issues the command of a deodorization start up, and a deodorization capacity change means 17 to choose an automatic change and manual change of deodorization capacity, The lighting control means 13 which controls ON of two or more light sources 6, and OFF, and the motorised control means 14 which adjusts the airflow of the ventilation means 4, Receive the signal of the odor level which the odor sensor S2 detected, and deodorization capacity is chosen as a multistage story. It has the 2nd control unit Cnt2 which consists of the 2nd microcomputer 18 which transmits a predetermined actuating signal to the lighting control means 13, the motorised control means 14, and the migration means 8. When a resident starts deodorization operation with the deodorization start-up means 16 and chooses the

automatic change of deodorization capacity with the deodorization capacity change means 17 further, the 2nd microcomputer 18 The signal of the odor level in the detected air is received from the odor sensor S2, data processing is performed based on the data of the odor level, and the optimal deodorization capacity is determined.

[0092] According to weakness, a predetermined actuating signal is transmitted the strength of deodorization capacity to the motorised means 14, the migration means 8, and the lighting control means 13.

[0093] When deodorization capacity is strength, in order to remove the odor component of habitation space promptly, the rate of prehension of an odor component is raised by making ventilation resistance into size, making blast weight as strength, and two or more light sources 6 are turned on, and the decomposition capacity of photocatalyst 3c is raised.

[0094] In the case of deodorization capacity weakness, the electron hole of photocatalyst 3c and the electronic probability of occurrence are lowered, and it enables it to decompose them efficiently to low odor level by turning on the light source 6 which makes blast weight weakness, makes ventilation resistance smallness since odor level is low, and irradiates ultraviolet rays with long wavelength out of two or more light sources 6.

[0095] Operation which thought deodorization as important according to liking of a resident as mentioned above can be efficiently performed with a sufficient precision.

[0096] Furthermore, when the light source 6 of short wavelength is on, the bacteria in air can also be sterilized directly.

[0097] (Example 5) Drawing 10 is the functional block diagram of the air conditioner by the example 5 of this invention. Drawing 11 is a flow chart which shows actuation of this example.

[0098] Cnt3 is the 3rd control unit which consists of a deodorization start-up means 16, the timer means 19, the lighting control means 13 and the motorised means 14, and the 3rd microcomputer 20.

[0099] If the signal of the start up from the deodorization start-up means 16 is received, the timer means 19 starts measurement of deodorization operation time, and after predetermined time passes, it will transmit the halt command of deodorization operation to the 3rd microcomputer 20. The 3rd microcomputer 20 receives the halt command of deodorization operation from the timer means 19, and is returned to the usual temperature control operation.

Moreover, the timer means 19 may be built in as one of the processors in the 3rd microcomputer.

[0100] About the air conditioner constituted as mentioned above, the actuation is explained based on the flow chart of drawing 11 below.

[0101] When performing operation which gave priority to deodorization capacity in the environment in which the odor component existed, as for a resident, in step 8, temperature control operation of an interior unit 1 is first started with the operation means 11. Then, in step 16, if the signal of the deodorization start up of an interior unit 1 is transmitted by the deodorization start-up means 16, in step 17, the timer means 19 will start measurement of deodorization operation time, and will also start further the comparison test of the predetermined time amount beforehand set as the timer means, and the execution time of deodorization operation in step 18.

[0102] Moreover, the 3rd microcomputer transmits a predetermined actuating signal to the motorised means 14, the lighting control means 13, and the migration means 8 at the same time it starts measurement of deodorization operation time at step 17, and it sets it to step 19. In order to remove the odor component of habitation space promptly, strength, as for the ventilation resistance of the deodorization filter 9, the migration means 8 raises the rate of prehension of an odor component as a size by ON, and the blast weight of the ventilation means 4 turns on two or more light sources 6, and it raises the decomposition capacity of photocatalyst 3c.

[0103] If the timer means 19 furthermore judges with having exceeded time amount predetermined in deodorization operation time at step 17, the stop signal of deodorization operation will be transmitted to the 3rd microcomputer 20. in step 8, the 3rd microcomputer performs the usual temperature control operation after a halt of deodorization operation -- as -- transmission [predetermined to the motorised means 14, the lighting control means 13, and the migration means 8] of operation -- it carries out.

[0104] A deodorization start-up means 16 by which the air conditioner of this example issues the command of a deodorization start up as mentioned above, The timer means 19 which issues the command of a halt after it measures deodorization operation time in response to the signal of a deodorization start up and predetermined time passes, The lighting control means 13 which controls ON of two or more light sources 6, and OFF, and the motorised control means 14 which adjusts the airflow of the ventilation means 4, Data processing of the predetermined signal sent from the timer means 19 is received and carried out. It has the 3rd control unit Cnt3 which consists of the 3rd microcomputer 20 which transmits a predetermined actuating signal to the lighting control means 13, the motorised control means 14, and the migration means 8. If a resident starts deodorization operation with the deodorization start-up means 16, while the timer means 19 will start measurement of deodorization operation time in response to the signal of a start up The 3rd microcomputer 20 transmits an actuating signal so that deodorization capacity may become strength, it raises the rate of prehension of an odor component by making ventilation resistance into size, making blast weight as strength, and turns on two or more light sources 6, and raises the decomposition capacity of photocatalyst 3c.

[0105] If the execution time of deodorization operation of the predetermined time set as the timer means 19 exceeds, the stop signal of deodorization operation will be taken out and it will change to the usual temperature control operation.

[0106] Low cost-ization is realizable by deodorization operation efficient as mentioned above and controlling deodorization operation, without using a sensor etc.

[0107] Moreover, the bacteria in air can also be directly sterilized by turning on the light source with short wavelength.

[0108]

[Effect of the Invention] As explained above, invention according to claim 1 It consists of two or more honeycomb-like adsorption material which supported the photocatalyst on the front face, a connecting means, and a migration means. Said two or more honeycomb-like adsorption material Aeration sides are parallel and approach and at least one honeycomb-like adsorption material is connected with said migration means through said connecting means. And by having made predetermined distance into the structure which can move in parallel to the aeration side of the honeycomb-like adsorption material of another side with said migration means, the deodorization capacity over an odor component is controllable by adjusting the change in the ventilation resistance of honeycomb-like adsorption material to arbitration.

[0109] Invention according to claim 2 in an interior unit Moreover, a heat exchanger and an odor removal filter, Two or more honeycomb-like adsorption material with which it consisted of a ventilation means, a wind back board, and two or more light sources that irradiate different ultraviolet-rays wavelength, and said odor removal filter supported the photocatalyst on the front face, It consists of said honeycomb-like adsorption material and support means of the same number, a connecting means, and a migration means. Said two or more honeycomb-like adsorption material is respectively supported independently from a support means. And aeration sides are parallel and approach and at least one honeycomb-like adsorption material is connected with said migration means through said connecting means. And by having the structure which can move predetermined distance in parallel to the aeration side of the honeycomb-like adsorption material of another side in accordance with a support means with said migration means, and having installed said two or more light sources 6 in the location which can irradiate ultraviolet radiation at said odor removal filter The deodorization capacity over an odor component is controllable by adjusting the change in the ventilation resistance of an odor removal filter to arbitration, and adjusting the exposure wavelength of the light source to arbitration. Moreover, the bacteria in air can also be directly sterilized by using the light source with short wavelength.

[0110] Moreover, the absorption thermo sensor which invention according to claim 3 is installed in air absorption opening of an interior unit, and detects the temperature of absorption air, The operation means which issues ON of temperature control operation of said interior unit, and the command of OFF, and a temperature control capacity change means to choose an automatic change and manual change of temperature control capacity, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Receive the signal of the temperature of the absorption air which said suction thermo sensor detected, and temperature control capacity is chosen as a multistage story. By having had the 1st control unit which consists of the 1st microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means If a resident chooses the automatic change of temperature control capacity with a temperature control capacity change means, said 1st microcomputer will receive the signal of the detected absorption temperature from said suction thermo sensor, will perform data processing based on the temperature data, and will determine temperature control capacity as a multistage story.

[0111] According to weakness, a predetermined actuating signal is transmitted the strength of temperature control capacity to said motorised means, said migration means, and said lighting control means. When temperature control capacity is strength, in order to make blast weight into strength, to make ventilation resistance into smallness, in order to make habitation space into comfortable temperature promptly, and to deodorize, two or more light sources are turned on and the decomposition capacity of a photocatalyst is raised. In the case of temperature control capacity weakness, since the amenity in the temperature side of habitation space is secured, in order that blast weight may be made into weakness and an inflow air content may deodorize few part odor components efficiently, a contact probability is raised by making ventilation resistance into size, it is turning on further two or more light sources, and deodorization capacity is also securable [giving priority to the amenity since the decomposition capacity of a photocatalyst is raised].

[0112] Moreover, the bacteria in air can also be directly sterilized according to the light source of short wavelength.

[0113] Moreover, the odor sensor by which invention according to claim 4 detects the odor level in the air installed in air absorption opening of said interior unit in invention according to claim 2, The deodorization start-up means which issues the command of a deodorization start up, and a deodorization capacity change means to choose an automatic change and manual change of deodorization capacity, The lighting control means which controls ON of two or more

of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Receive the signal of the odor level which said odor sensor detected, and deodorization capacity is chosen as a multistage story. By having had the 2nd control unit which consists of the 2nd microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means When a resident starts deodorization operation with said deodorization start-up means and chooses the automatic change of deodorization capacity with a deodorization capacity change means further, said 2nd microcomputer The signal of the odor level in the detected air is received from said odor sensor, data processing is performed based on the data of the odor level, and the optimal deodorization capacity is determined.

[0114] According to weakness, a predetermined actuating signal is transmitted the strength of deodorization capacity to said motorised means, said migration means, and said lighting control means. When deodorization capacity is strength, in order to remove the odor component of habitation space promptly, the rate of prehension of an odor component is raised by making ventilation resistance into size, making blast weight as strength, and two or more light sources are turned on and the decomposition capacity of a photocatalyst is raised. In the case of deodorization capacity weakness, the electron hole of a photocatalyst and the electronic probability of occurrence are lowered, and it enables it to decompose them efficiently to low odor level by turning on the light source which makes blast weight weakness, makes ventilation resistance smallness since odor level is low, and irradiates ultraviolet rays with long wavelength out of two or more light sources. According to liking of a resident, accurate efficient deodorization operation is realizable as mentioned above.

[0115] Furthermore, when the light source of short wavelength is on, the bacteria in air can also be sterilized directly.

[0116] Moreover, a deodorization start-up means by which invention according to claim 5 issues the command of a deodorization start up in invention according to claim 2, The timer means which issues the command of a halt after it measures deodorization operation time in response to the signal of a deodorization start up and predetermined time passes, The lighting control means which controls ON of two or more of said light sources, and OFF, and the motorised control means which adjusts the airflow of said ventilation means, Data processing of the predetermined signal sent from said timer means is received and carried out. By having had the 3rd control unit which consists of the 3rd microcomputer which transmits a predetermined actuating signal to said lighting control means, motorised control means, and said migration means, a resident If deodorization operation is started with said deodorization start-up means, while a timer means will start measurement of deodorization operation time in response to the signal of a start up, the 3rd microcomputer An actuating signal is transmitted so that deodorization capacity may become strength, the rate of prehension of an odor component is raised by making ventilation resistance into size, making blast weight as strength, and two or more light sources are turned on and the decomposition capacity of a photocatalyst is raised.

[0117] If the execution time of deodorization operation of the predetermined time set as the timer means exceeds, the stop signal of deodorization operation will be taken out and it will change to the usual temperature control operation. Low cost-ization is realizable by deodorization operation efficient as mentioned above and controlling deodorization operation, without using a sensor etc.

[0118] Moreover, the bacteria in air can also be directly sterilized by turning on the light source with short wavelength.

*** NOTICES ***

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The front view of the odor removal filter of the example 1 by this invention

[Drawing 2] The front view at the time of making the ventilation resistance of the odor removal filter of this example increase

[Drawing 3] The sectional view of the interior unit of the air conditioner of the example 2 by this invention

[Drawing 4] The front view of the odor removal filter by this example

[Drawing 5] The front view at the time of making the ventilation resistance of the odor removal filter of this example increase

[Drawing 6] The functional block diagram of the air conditioner of the example 3 by this invention

[Drawing 7] The flow chart which shows actuation of the air conditioner of this example

[Drawing 8] The functional block diagram of the air conditioner of the example 4 by this invention

[Drawing 9] The flow chart which shows actuation of the air conditioner of this example

[Drawing 10] The functional block diagram of the air conditioner of the example 5 by this invention

[Drawing 11] The flow chart which shows actuation of the air conditioner of this example

[Drawing 12] The sectional view of the interior unit of the conventional air conditioner

[Drawing 13] The front view of the conventional odor removal filter

[Drawing 14] The expanded sectional view of a part which makes the deodorization function of the conventional odor removal filter discover

[Description of Notations]

1 Interior Unit

2 Heat Exchanger

3a Honeycomb-like adsorption material

3c Photocatalyst

4 Ventilation Means

5 Wind Back Board

6 Light Source

7 Connecting Means

8 Migration Means

9 Odor Removal Filter

10 Support Means

11 Operation Means

12 Driving Ability Change Means

13 Lighting Control Means

14 Motorised Control Means

15 1st Microcomputer

16 Deodorization Start-Up Means

17 Deodorization Capacity Change Means

18 2nd Microcomputer

19 Timer Means

20 3rd Microcomputer

S1 Absorption thermo sensor

S2 Odor sensor

Cnt1 The 1st control unit

Cnt2 The 2nd control unit

Cnt3 The 3rd control unit

[Translation done.]

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最終頁に続く

(54) 【発明の名称】 脱臭フィルタおよびそれを搭載した空気調和機

(57) 【要約】

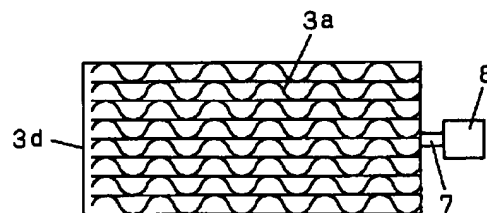
【課題】 光触媒を担持した脱臭フィルタに関し、通気抵抗を状況に応じて変化させる構造とし、臭気成分に対する脱臭能力を制御する。

【解決手段】 表面に光触媒を担持した複数のハニカム状吸着材3aと、接続手段7と、移動手段8とからなり、複数のハニカム状吸着材3aは、通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材3aは接続手段7を介して移動手段8に連結されており、かつ移動手段8によって所定距離を他方のハニカム状吸着材3aの通気面に対し平行に移動できる構造となっているため、ハニカム状吸着材3aの通気抵抗の増減を任意に調整することで臭気成分に対する脱臭能力を制御することができる。

3a ハニカム状吸着材

7 接続手段

8 移動手段



【特許請求の範囲】

【請求項1】 表面に光触媒を担持した複数のハニカム状吸着材と、接続手段と、移動手段とからなり、前記複数のハニカム状吸着材は、通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材は前記接続手段を介して前記移動手段に連結されており、かつ前記移動手段によって所定距離を他方のハニカム状吸着材の通気面に対し平行に移動できる構造となっていることを特徴とする脱臭フィルタ。

【請求項2】 室内機内に、熱交換器と、脱臭フィルタと、送風手段と、風向板と、異なる紫外線波長を照射する複数の光源とからなり、

前記脱臭フィルタが表面に光触媒を担持した複数のハニカム状吸着材と、前記ハニカム状吸着材と同数の支持手段と、接続手段と、移動手段とからなり、

前記複数のハニカム状吸着材は各々支持手段より独立して支持され、かつ通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材は前記接続手段を介して前記移動手段に連結されており、かつ前記移動手段により所定距離を支持手段に沿って他方のハニカム状吸着材の通気面に対し平行に移動できる構造を有し、前記複数の光源は前記脱臭フィルタに紫外光を照射できる位置に設置されていることを特徴とする空気調和機。

【請求項3】 前記室内機の空気吸い込み口に設置され、吸い込み空気の状態を検知する吸い込み温度センサーと、前記室内機の温調運転のON、OFFの指令を出す運転手段と、温調能力の自動切替と手動切替を選択する温調能力切替手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記吸い込み温度センサーが検知した吸い込み空気の状態の信号を受信して温調能力を多段階に選択し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第1のマイクロコンピュータとからなる第1の制御装置を備えたことを特徴とする請求項2記載の空気調和機。

【請求項4】 前記室内機の空気吸い込み口に設置された空気中の臭気レベルを検知する臭気センサーと、脱臭運転開始の指令を出す脱臭運転開始手段と、脱臭能力の自動切替と手動切替を選択する脱臭能力切替手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記臭気センサーが検知した臭気レベルの信号を受信して脱臭能力を多段階に選択し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第2のマイクロコンピュータとからなる第2の制御装置を備えたことを特徴とする請求項2記載の空気調和機。

【請求項5】 脱臭運転開始の指令を出す脱臭運転開始手段と、脱臭運転開始の信号を受けて脱臭運転時間を計測し、所定時間が経過した後停止の指令を出すタイマー

手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記タイマー手段から発信される所定の信号を受信して演算処理し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第3のマイクロコンピュータとからなる第3の制御装置を備えたことを特徴とする請求項2記載の空気調和機。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は光触媒を用いて空気中の臭い成分などの汚染物質を除去する脱臭フィルタおよびそれを搭載した空気調和機に関するものである。

【0002】

【従来の技術】近年、住空間においては、煙草やトイレ等の生活臭の脱臭に加えて、新築住宅における建材や仕上げ材などから発生する揮発性有機物質（VOC）など、有機物質による室内空気汚染への対策が注目されている。また、MRSA等の院内感染問題に代表されるような、室内の抗菌性に対しても大きな関心が集まっている。これらの脱臭や抗菌に対する手段の一つとして、光の照射により強力な酸化分解効果を発現する光触媒が利用されている。

【0003】光触媒の効果を脱臭用途に利用した従来の空気調和機としては、例えば特開平1-234729号公報に示されているものがある。

【0004】以下図面を参照しながら上記従来の空気調和機についての説明を行う。

【0005】図12は従来の空気調和機の室内機の断面図である。また図13は従来の脱臭フィルタの正面図である。さらに図14は従来の脱臭フィルタの脱臭機能を発現させる部位の拡大断面図である。

【0006】図12、図13及び図14において、1は空気調和機の室内機であり内部に熱交換器2と、脱臭フィルタ3と、送風手段4と、風向板5と、紫外線を照射する光源6を有し、脱臭フィルタ3は熱交換器2の背面に設置されており、光源6は脱臭フィルタ3に紫外線を照射できる位置に設置されている。

【0007】脱臭フィルタ3は、図13及び図14に示されるように、ハニカム状吸着材3aの表面および細孔3bに光触媒3cを担持した構造を有し、また脱臭剤3の衝撃に対する破損防止のために、ハニカム状吸着材3aをスポンジ状緩衝材3dで包んだ構造となっている。

【0008】ハニカム状吸着材3aの材料としては活性炭、ゼオライト、多孔質セラミックなどが使用されている。

【0009】また光触媒3cの材料としては、アナターゼ型二酸化チタン（ TiO_2 ）、酸化亜鉛（ ZnO ）及び三酸化タングステン（ WO_3 ）等を用いることが可能であるが、この中でも二酸化チタンは弱い紫外線でも十

分な脱臭機能を発揮でき、広範囲な物質、例えば、アンモニア、アセトアルデヒド、酢酸、トリメチルアミン、メチルメルカプタン、硫化水素、スチレン、硫化メチル、二硫化ジメチル及びイソ吉草酸等の悪臭を除去できることから好ましいものとなっている。

【0010】またさらに、光触媒3cは、ゾル状に形成された二酸化チタン系溶液中にハニカム吸着材3aを浸漬し、ついで乾燥させることにより担持することも可能である。

【0011】以上のような構成からなる空気調和機について、以下にその動作を説明する。

【0012】図12の矢印に示すように、室内空気は室内機1の上部から吸引され熱交換器2、脱臭フィルタ3、送風機4を通り再び室内に吐出される。光源6は光触媒3cが担持された脱臭フィルタ3の脱臭効果を発現させるために紫外線を照射するものである。

【0013】光源6によって脱臭フィルタ3上の光触媒3cに紫外線が照射されると、光触媒3cの表面に発生した正孔が、光触媒3c表面の吸着水と反応してラジカルOH（水素基ラジカル）が生成され、このラジカルOHが有機物の分子結合を切断することにより、例えばアンモニア等の臭気成分を酸化分解し、無臭化することができる。

【0014】ここで、臭気成分を含んだ空気が室内機1内に吸入されて、臭気フィルタ3を通過する場合に、臭気成分のうち分解されやすいものは、ハニカム状吸着材3aに吸着される前に、光触媒3cにより分解され、分解速度の遅い臭気成分はハニカム状吸着材3aに一端吸着して蓄積した後、光触媒3cにより徐々に分解されることになる。

【0015】以上のように脱臭フィルタ3を構成するハニカム状吸着材3aは、光源6からの紫外線照射により光触媒3cを励起させることによって、吸着物質の酸化分解を行い、吸着表面からの除去を行うために、常に吸着表面は清浄化され吸着能力の低下が防がれ、脱臭効果を長期間保存することができる。またさらに送風手段4の送風量の増減で、空気中の臭気成分と脱臭フィルタ3との接触確率を変化させることにより脱臭能力を調整することができる。

【0016】

【発明が解決しようとする課題】しかしながら、上記従来の構成は、送風手段4の送風量の増減によって、脱臭能力を調整するが、脱臭フィルタ3の通気抵抗が一定の場合、送風量が多いときは空気中に含まれる臭気成分と脱臭フィルタ3との接触確率が高く脱臭能力は大きい。送風量が少ない時は臭気成分と脱臭フィルタ3との接触確率が低くなるため脱臭能力が低下する。このため居住環境が十分快適な温度に保たれた状態で臭気成分が多く存在した場合、脱臭能力を大きくするために送風量を増やすと、温度面での快適性を損なうという欠点があ

った。

【0017】すなわち、上記従来の構成は、光触媒3cを担持したハニカム状吸着材3a自体の脱臭能力を直接調整できないという欠点があった。

【0018】本発明は従来の課題を解決するもので、ハニカム状吸着材の通気抵抗の増減を任意に調整して脱臭能力を制御することができる脱臭フィルタを提供することを目的とする。

【0019】また、本発明は従来の課題を解決するもので、通気抵抗の増減を任意に調整することが可能な脱臭フィルタを有し、脱臭能力を制御することができる空気調和機を提供することを目的とする。

【0020】また本発明の他の目的は、居住者の目的に応じて快適性重視の温調運転と空気質浄化を重視した脱臭運転とを使い分けことができ、また室内の温度や空気の汚れ度合いに応じて温調能力と脱臭能力を高いレベルで精度良く維持できる空気調和機を提供することである。

【0021】またさらに本発明の他の目的は、脱臭運転をタイマー制御で行うことで、低コストで効率の良く空気質の浄化操作を行える空気調和機を提供することを目的とする。

【0022】また、上記従来の構成は、光源6が常に一定の波長の紫外線を脱臭フィルタ3に担持されている光触媒3cに照射するために、空気が汚れていないときでも、過剰なエネルギーレベルの紫外線が光触媒3cに照射されることとなる。この場合光触媒3c表面では高い密度で励起した電子と正孔が発生しているが、臭気成分が少ないため正孔の消費が少なく、その分密度が高い状態での電子と正孔の再結合の確率が大きくなり、結果的に臭気物質に対する酸化分解効率が低下するという欠点が存在した。

【0023】本発明は従来の課題を解決するもので、異なる紫外線波長を照射する複数の光源の照射波長を、空気中の臭気レベルに応じて使い分けることにより、光触媒の正孔の発生率を適正化できる空気調和機を提供することを目的とする。

【0024】

【課題を解決するための手段】この目的を達成するために本発明は、表面に光触媒を担持した複数のハニカム状吸着材と、接続手段と、移動手段とからなり、前記複数のハニカム状吸着材は、通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材は前記接続手段を介して前記移動手段に連結されており、かつ前記移動手段によって所定距離を他方のハニカム状吸着材の通気面に対し平行に移動できる構造となっているので脱臭能力を制御することができる。

【0025】また、本発明は、室内機内に、熱交換器と、脱臭フィルタと、送風手段と、風向板と、異なる紫外線波長を照射する複数の光源とからなり、前記脱臭フ

フィルタは表面に光触媒を担持した複数のハニカム状吸着材と、前記ハニカム状吸着材と同数の支持手段と、接続手段と、移動手段とからなり、前記複数のハニカム状吸着材は各々支持手段より独立して支持され、かつ通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材は前記接続手段を介して前記移動手段に連結されており、かつ前記移動手段により所定距離を支持手段に沿って他方のハニカム状吸着材の通気面に対し平行に移動できる構造を有し、前記複数の光源は前記脱臭フィルタに紫外光を照射できる位置に設置されているので、臭気成分に対する脱臭能力を制御することができ、さらに空気中の細菌を直接殺菌することができる。

【0026】またさらに、本発明は、前記室内機の空気吸い込み口に設置され、吸い込み空気の温度を検知する吸い込み温度センサーと、前記室内機の温調運転のON、OFFの指令を出す運転手段と、温調能力の自動切替と手動切替を選択する温調能力切替手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記吸い込み温度センサーが検知した吸い込み空気の温度の信号を受信して温調能力を多段階に選択し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第1のマイクロコンピュータとからなる第1の制御装置を備えているので、快適性を優先しながら脱臭能力も確保できる。

【0027】またさらに、本発明は、前記室内機の空気吸い込み口に設置された空気中の臭気レベルを検知する臭気センサーと、脱臭運転開始の指令を出す脱臭運転開始手段と、脱臭能力の自動切替と手動切替を選択する脱臭能力切替手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記臭気センサーが検知した臭気レベルの信号を受信して脱臭能力を多段階に選択し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第2のマイクロコンピュータとからなる第2の制御装置を備えているので、居住者の好みに応じて脱臭を重視した運転を、精度良く効率的に実施することができる。

【0028】またさらに、本発明は、臭気運転開始の指令を出す脱臭運転開始手段と、脱臭運転開始の信号を受けて脱臭運転時間を計測し、所定時間が経過した後停止の指令を出すタイマー手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記タイマー手段から発信される所定の信号を受信して演算処理し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第3のマイクロコンピュータとからなる第3の制御装置を備えているので、効率的な脱臭運転と、センサー等を用いずに脱臭運転の制御を行うことで低コスト化が実現できる。

【0029】

【発明の実施の形態】本発明の請求項1に記載の発明は、表面に光触媒を担持した複数のハニカム状吸着材と、接続手段と、移動手段とからなり、前記複数のハニカム状吸着材は、通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材は前記接続手段を介して前記移動手段に連結されており、かつ前記移動手段によって所定距離を他方のハニカム状吸着材の通気面に対し平行に移動できる構造となっており、ハニカム状吸着材の通気抵抗の増減を任意に調整することで臭気成分に対する脱臭能力を制御することができるという作用を有する。

【0030】請求項2に記載の発明は、室内機内に、熱交換器と、脱臭フィルタと、送風手段と、風向板と、異なる紫外線波長を照射する複数の光源とからなり、前記脱臭フィルタは表面に光触媒を担持した複数のハニカム状吸着材と、前記ハニカム状吸着材と同数の支持手段と、接続手段と、移動手段とからなり、前記複数のハニカム状吸着材は各々支持手段より独立して支持され、かつ通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材は前記接続手段を介して前記移動手段に連結されており、かつ前記移動手段により所定距離を支持手段に沿って他方のハニカム状吸着材の通気面に対し平行に移動できる構造を有し、前記複数の光源は前記脱臭フィルタに紫外光を照射できる位置に設置されたものであり、脱臭フィルタの通気抵抗の増減を任意に調整し、また光源の照射波長を任意に調整することで臭気成分に対する脱臭能力を制御することができ、さらに波長の短い光源を用いることで空気中の細菌を直接殺菌できるという作用を有する。

【0031】請求項3に記載の発明は、請求項2に記載の発明において、前記室内機の空気吸い込み口に設置され、吸い込み空気の温度を検知する吸い込み温度センサーと、前記室内機の温調運転のON、OFFの指令を出す運転手段と、温調能力の自動切替と手動切替を選択する温調能力切替手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記吸い込み温度センサーが検知した吸い込み空気の温度の信号を受信して温調能力を多段階に選択し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第1のマイクロコンピュータとからなる第1の制御装置を備えたものであり、ここで、臭気成分が存在した環境で温調能力を優先した運転を行う場合、居住者が温調能力切替手段により温調能力の自動切替を選択すると、前記第1のマイクロコンピュータは、検知した吸い込み温度の信号を前記吸い込み温度センサーから受信し、その温度データをもとに演算処理を行い、多段階に温調能力を決定する。

【0032】温調能力の強、弱に応じて前記モータ駆動

手段と、前記移動手段と、前記点灯制御手段に対し所定の動作信号を送信する。

【0033】温調能力が強い場合は、速やかに居住空間を快適な温度にするため送風量を強、通気抵抗を小とし、また脱臭を行うため複数の光源を点灯して光触媒の分解能力を向上させる。

【0034】温調能力弱の場合は、居住空間の温度面での快適性は確保されているので送風量を弱とし、また流入空気量が少ない分臭気成分を効率よく脱臭するために、通気抵抗を大として接触確率を向上させ、さらに複数の光源を点灯することで、光触媒の分解能力を向上させる。

【0035】以上のように快適性を優先しながら脱臭能力も確保できるという作用を有する。

【0036】請求項4に記載の発明は、請求項2に記載の発明において、前記室内機の空気吸い込み口に設置された空気中の臭気レベルを検知する臭気センサーと、脱臭運転開始の指令を出す脱臭運転開始手段と、脱臭能力の自動切替と手動切替を選択する脱臭能力切替手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記臭気センサーが検知した臭気レベルの信号を受信して脱臭能力を多段階に選択し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第2のマイクロコンピュータとからなる第2の制御装置を備えたものであり、ここで、臭気成分が存在した環境で温調能力を優先した運転を行う場合、居住者が前記脱臭運転開始手段によって脱臭運転を開始し、さらに脱臭能力切替手段により脱臭能力の自動切替を選択すると、前記第2のマイクロコンピュータは、検知した空気中の臭気レベルの信号を前記臭気センサーから受信し、その臭気レベルのデータをもとに演算処理を行い、最適な脱臭能力を決定する。脱臭能力の強、弱に応じて前記モータ駆動手段と、前記移動手段と、前記点灯制御手段に対し所定の動作信号を送信する。

【0037】脱臭能力が強い場合は、速やかに居住空間の臭気成分の除去を行うため送風量を強、通気抵抗を大として臭気成分の捕捉率を向上させ、また複数の光源を点灯して光触媒の分離能力を向上させる。

【0038】脱臭能力弱の場合は、臭気レベルは低いので送風量を弱、通気抵抗を小とし、また複数の光源の中から波長の長い紫外線を照射する光源を点灯することで、光触媒の正孔と電子の発生確率を下げ低い臭気レベルに対して効率よく分解できるようにする。

【0039】以上のように居住者の好みに応じて脱臭を重視した運転を、精度良く効率的に実施することができるという作用を有する。

【0040】請求項5に記載の発明は、請求項2に記載の発明において、脱臭運転開始の指令を出す脱臭運転開始手段と、脱臭運転開始の信号を受けて脱臭運転時間を

計測し、所定時間が経過した後停止の指令を出すタイマー手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記タイマー手段から発信される所定の信号を受信して演算処理し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第3のマイクロコンピュータとからなる第3の制御装置を備えたものであり、ここで、臭気成分が存在した環境で脱臭能力を優先した運転を行う場合、居住者は、前記脱臭運転開始手段によって脱臭運転を開始すると、タイマー手段は運転開始の信号を受けて脱臭運転開始時間の計測を開始すると共に、第3のマイクロコンピュータは、脱臭能力が強となるように動作信号を送信し、送風量を強、通気抵抗を大として臭気成分の捕捉率を向上させ、また複数の光源を点灯して光触媒の分解能力を向上させる。

【0041】タイマー手段に設定されている所定時間を脱臭運転の実行時間が超えると脱臭運転の停止信号が出され、通常の温調運転に切り替わる。以上のように効率的な脱臭運転と、センサー等を用いずに脱臭運転の制御を行うことで低コスト化が実現できるという作用を有する。

【0042】

【実施例】以下、本発明による脱臭フィルタおよびそれを搭載した空気調和機の実施例について、図面を参照しながら説明する。尚、従来と同一構成については、同一符号を付して詳細な説明を省略する。

【0043】尚、本発明で示されている光触媒とは、二酸化チタン、酸化亜鉛、酸化錫、酸化ジルコニウム、酸化タングステン、酸化鉄、チタン酸ストロンチウム及びチタン酸バリウムからなる群の内少なくとも1種を構成成分として用いたものである。この中でも二酸化チタンは、弱い紫外線でも十分な脱臭機能を発揮できる点より好ましい。

【0044】また、本発明に示されている紫外線波長の種類としては、殺菌灯として用いられる245nmの波長と、ブラックライトとして用いられる365nmの波長が代表的なものであり、両方同時に用いるのが好ましい。但し、本発明に示される紫外線は、前記波長に制限されず、400nm以下の波長であれば問題なく、使用する光源に関しても若干量の紫外線を照射する蛍光灯を用いても構わない。

【0045】(実施例1) 図1は、本発明の実施例1による脱臭フィルタの正面図である。図2は同実施例の脱臭フィルタの通気抵抗を増加させた場合の正面図である。

【0046】図1、図2において、7は接続手段であり、8は移動手段であり、光触媒3cを担持した複数のハニカム状吸着材3aの内少なくとも一つハニカム状吸着材3aは、接続手段7を介して移動手段8に連結さ

れている。また複数のハニカム状吸着材3は、通気面同士が平行かつ近接した状態とする。接続手段7はハニカム状吸着材3aと移動手段8に対し緩みがなく確実に固定されている。移動手段8は、ソレノイド等の電磁的手段を使用できる。またモータを用いた回転伸縮動作により無段階に移動距離を調整できる手段を用いると、微調整が行える点より尚好ましい。

【0047】以上のように構成された脱臭フィルタについて、以下その動作を説明する。

【0048】光触媒3cを担持した複数のハニカム状吸着材3a同士がその形状に沿って完全に重なっている場合、通気面方向から見た通気抵抗は、単一のハニカム状吸着材3aと同等であるが、移動手段8を動作させた場合、ハニカム状吸着材3aは、他のハニカム状吸着材3aの通気面に対して平行に移動し、図2に示されるように、ハニカム状吸着材3aの通気面同士がずれた状態となるために、通気抵抗が大幅に増加し、脱臭能力を向上させることができる。

【0049】以上のように本実施例の脱臭フィルタは、表面に光触媒3cを担持した複数のハニカム状吸着材3aと、接続手段7と、移動手段8とからなり、複数のハニカム状吸着材3aは、通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材3aは接続手段7を介して移動手段8に連結されており、かつ移動手段8によって所定距離を他方のハニカム状吸着材3aの通気面に対し平行に移動できる構造となっているため、ハニカム状吸着材3aの通気抵抗の増減を任意に調整することで臭気成分に対する脱臭能力を制御することができるという作用を有する。

【0050】(実施例2)図3は、本発明の実施例2による空気調和機の室内機の断面図である。図4は、同実施例の脱臭フィルタの正面図であり、図5は同実施例の脱臭フィルタの通気抵抗を増加させた場合の正面図である。

【0051】図3、図4及び図5において、6は光源であり、異なる紫外線波長を照射する複数の光源6が設置されている。光源6の照射する紫外線波長の種類としては、殺菌灯として用いられる245nmの波長と、ブラックライトとして用いられる365nmの波長が代表的なものであり、両方同時に用いるのが好ましい。但し、本実施例に示される紫外線は、上記波長に制限されず、400nm以下の波長であれば問題なく、使用する光源6に関しても若干量の紫外線を照射する蛍光灯を用いても構わない。

【0052】9は脱臭フィルタであり、脱臭フィルタ9は、表面に光触媒3cを担持した複数のハニカム状吸着材3aと、ハニカム状吸着材3aと同数の支持手段10と、接続手段7と、移動手段8とから構成されている。脱臭フィルタ9は支持手段10により室内機1内に設置されている。また複数の光源6は脱臭フィルタ9に紫外

光を照射できる位置に設置されている。

【0053】以上のように構成された空気調和機について、以下その動作を説明する。

【0054】光触媒3cを担持した複数のハニカム状吸着材3a同士が形状に沿って完全に重なっている場合、通気面方向から見た通気抵抗は、単一のハニカム状吸着材3aと同等であるが、移動手段8を動作させた場合、ハニカム状吸着材3aは、他のハニカム状吸着材3aの通気面に対し、支持手段9に沿って平行に移動し、図5に示されるように、ハニカム状吸着材3aの通気面同士がずれた状態となるために、通気抵抗が大幅に増加し、脱臭能力を向上させることができる。

【0055】また、複数の光源の照射する波長を組み合わせ調整することで、光触媒3cの分解効率を高レベルで維持でき、さらに脱臭能力を向上させることができ、また、短い波長の光源6を用いることで空気中の細菌を直接殺菌することができる。

【0056】以上のように本実施例の空気調和機は、室内機1内に、熱交換器2と、脱臭フィルタ9と、送風手段4と、風向板5と、異なる紫外線波長を照射する複数の光源6とからなり、脱臭フィルタ9は表面に光触媒3cを担持した複数のハニカム状吸着材3aと、ハニカム状吸着材3aと同数の支持手段10と、接続手段7と、移動手段8とからなり、複数のハニカム状吸着材3aは各々支持手段10より独立して支持され、かつ通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材3aは接続手段7を介して移動手段8に連結されており、かつ移動手段8により所定距離を支持手段10に沿って他方のハニカム状吸着材3aの通気面に対し平行に移動できる構造を有し、複数の光源6は脱臭フィルタ9に紫外光を照射できる位置に設置されているため、脱臭フィルタ9の通気抵抗の増減を任意に調整し、また光源6の照射波長を任意に調整することで臭気成分に対する脱臭能力を制御することができる。また、波長の短い光源6を用いることで空気中の細菌を直接殺菌することができる。

【0057】(実施例3)図6は、本発明の実施例3による空気調和機の機能ブロック図である。図7は、同実施例の動作を示すフローチャートである。

【0058】図6において、S1は、吸い込み温度センサーであり、室内機1の空気吸い込み口に設置されており、吸い込まれる空気の温度を検知する。用いる温度センサーとしては、例えばサーミスタ方式等を用いるのがコスト面と精度面から好ましい。

【0059】Cnt1は、運転手段11と温度能力切替手段12、点灯制御手段13、モータ駆動手段14と、第1のマイクロコンピュータ15とから構成される第1の制御装置である。

【0060】第1のマイクロコンピュータ15は、吸い込み温度センサーS1が検知した吸い込み空気の温度の

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信号を受信して温調能力を多段階に選択し、点灯制御手段13、モータ駆動制御手段14及び移動手段8に対し所定の動作信号を送信する。また移動手段8がONの時はハニカム状吸着材3aが移動して脱臭フィルタ9の通気抵抗が大となり、OFFの時はハニカム状吸着材3aが移動せず通気抵抗が小となる。

【0061】運転手段11は、室内機の温調運転のON、OFFの指令を出す。温調能力切替手段12は、居住者が入力する毎に自動、強、弱の指令信号を出し、温調能力の自動切替と手動切替を選択できる。自動の場合

は、吸い込み温度センサーS1が検知した吸い込み空気

の温度をもとに温調能力を自動的に選択する温調運転を実行する。また、強、弱を選択することで居住者の好みに応じた温調能力の手動選択が可能である。

【0062】点灯制御手段12は、異なる紫外線を照射する複数の光源6の点灯の組み合わせを制御し、照射する波長を調整する。

【0063】モータ駆動制御手段14は、送風手段4のモータ回転数を制御して送風量を強、弱の多段階に調整する。

【0064】以上のように構成された空気調和機について、以下その動作を図7のフローチャートをもとにして説明する。

【0065】臭気成分が存在した環境で温調能力を優先した運転を行う場合、まずステップ1において、居住者は運転手段11により室内機1の運転開始の信号を第1のマイクロコンピュータ15に送信し、温調運転を開始する。

【0066】続いてステップ2において、居住者は温調能力切替手段12により温調能力の自動切替、手動切替を選択する。自動切替を選択した場合には、まずステップ3において、吸い込み温度センサーS1で検知した吸い込み温度が第1のマイクロコンピュータ15に入力される。

【0067】ステップ4において第1のマイクロコンピュータ15が検知した吸い込み温度と予め設定されている所定の温度との比較判定を行い、温調能力を強、弱の2段階で決定し、ステップ5において決定した温調能力に対応した動作信号をモータ駆動手段14、点灯制御手段13、移動手段8に送信する。

【0068】また、ステップ2で手動切替を選択した場合、ステップ5で居住者の好みの温調能力を手動選択できる。

【0069】ステップ5で強の信号を送信した場合、速やかに居住空間を快適な温度にするため、ステップ6で送風手段4の送風量は強、移動手段8はOFFで脱臭フィルタ9の通気抵抗は小とし、また脱臭を行うため点灯制御手段13は複数の光源6を点灯して光触媒3cの分解能力を向上させる。

【0070】ステップ5で弱の信号を送信した場合、居

住空間の温度面での快適性は確保されているのでステップ7で送風手段4の送風量は弱とし、流入空気量が少ない分臭気成分を効率よく脱臭するために、移動手段8はONで脱臭フィルタ9の通気抵抗を大として接続確率を向上させ、さらに複数の光源6を点灯することで、光触媒の分解能力を向上させる。

【0071】以上のように本実施例の空気調和機は、室内機1の空気吸い込み口に設置され、吸い込み空気の温度を検知する吸い込み温度センサーS1と、室内機の温調運転のON、OFFの指令を出す運転手段11と、温調能力の自動切替と手動切替を選択する温調能力切替手段12と、複数の光源6のON、OFFを制御する点灯制御手段13と、送風手段の風量を調整するモータ駆動制御手段14と、吸い込み温度センサーS1が検知した吸い込み空気の温度の信号を受信して温調能力を多段階に選択し、点灯制御手段13とモータ駆動制御手段14と移動手段8に対し所定の動作信号を送信する第1のマイクロコンピュータ15とからなる第1の制御装置Cnt1を備えたものであり、居住者が温調能力切替手段12により温調能力の自動切替を選択すると、第1のマイクロコンピュータ15は、検知した吸い込み温度の信号を前記吸い込み温度センサーS1から受信し、その温度データをもとに演算処理を行い、多段階に温調能力を決定する。

【0072】温調能力の強、弱に応じて前記モータ駆動手段14と、前記移動手段8と、前記点灯制御手段13に対し所定の動作信号を送信する。

【0073】温調能力が強の場合は、速やかに居住空間を快適な温度にするため送風量を強、通気抵抗を小とし、また脱臭を行うため複数の光源6を点灯して光触媒3cの分解能力を向上させる。

【0074】温調能力弱の場合は、居住空間の温度面での快適性は確保されているので送風量を弱とし、また流入空気量が少ない分臭気成分を効率よく脱臭するために、通気抵抗を大として接続確率を向上させ、さらに複数の光源6を点灯することで、光触媒3cの分解能力を向上させるので快適性を優先しながら脱臭能力も確保できる。

【0075】また、短い波長の光源6により空気中の細菌を直接殺菌することもできる。

【0076】(実施例4)図8は、本発明の実施例4による空気調和機の機能ブロック図である。図9は、同実施例の動作を示すフローチャートである。

【0077】図8において、S2は、臭気センサーであり、室内機1の空気吸い込み口に設置されており、吸い込まれる空気中の臭気レベルを検知する。検知センサーS2は、例えば室内機1を居住空間で使用する場合には、比較的多く存在するアンモニアや、煙草臭の臭気成分であるアセトアルデヒドや酢酸等を検知対象とするセンサーを使用するのが好ましい。

【0078】Cnt 2は、脱臭運転開始手段16と脱臭能力切替手段17、点灯制御手段13、モータ駆動手段14と、第2のマイクロコンピュータ18とから構成される第2の制御装置である。

【0079】第2のマイクロコンピュータ18は、臭気センサーS2が検知した吸い込み空気中の臭気レベルの信号を受信して臭気能力を多段階に選択し、点灯制御手段13、モータ駆動制御手段14及び前記移動手段8に対し所定の動作信号を送信する。

【0080】脱臭運転開始手段16は、室内機が温調運転中に脱臭運転を開始する指令を出す。また脱臭運転を停止する際は、温調運転切替手段12を入力することで、温調運転に復帰することができる。

【0081】脱臭能力切替手段17は、居住者が入力する毎に自動、強、弱の指令信号を出し、脱臭能力の自動切替と手動切替を選択できる。自動の場合は、臭気センサーS2が検知した吸い込み空気中の臭気レベルをもとに脱臭能力を自動的に選択する脱臭運転を実行する。また、強、弱を選択することで居住者の好みに応じた脱臭能力の手動選択が可能である。

【0082】本実施例は、請求項3の空気調和機に臭気センサーS2と第2の制御装置Cnt 2を加えたものである。

【0083】以上のように構成された空気調和機について、以下その動作を図9のフローチャートをもとにして説明する。

【0084】臭気成分が存在した環境で脱臭能力を優先した運転を行う場合、まずステップ8において、居住者は、運転手段11により室内機1の温調運転を開始する。続いて、ステップ9において、脱臭運転開始手段16により室内機1の脱臭運転開始の信号を第2のマイクロコンピュータに送信し、脱臭運転を開始する。

【0085】さらに、ステップ10において、居住者は脱臭能力切替手段17により脱臭能力の自動切替、手動切替を選択する。

【0086】自動切替を選択した場合には、まずステップ11において、臭気センサーS2で検知した臭気レベルが第2のマイクロコンピュータ18に入力される。

【0087】ステップ12において第2のマイクロコンピュータ18が検知した臭気レベルと予め設定されている所定の臭気レベルとの比較判定を行い、脱臭能力を強、弱の2段階で決定し、ステップ13において決定した脱臭能力に対応した動作信号をモータ駆動手段14、点灯制御手段13、移動手段8に送信する。

【0088】また、ステップ10で手動切替を選択した場合、ステップ13で居住者の好みの脱臭能力を手動選択できる。

【0089】ステップ13で強の信号を送信した場合、速やかに居住空間の臭気成分の除去を行うためにステップ14で送風手段4の送風量は強、移動手段8はONで

脱臭フィルタ9の通気抵抗は大として臭気成分の捕捉率を向上させ、また複数の光源6を点灯して光触媒3cの分解能力を向上させる。

【0090】ステップ13で弱の信号を送信した場合、臭気レベルは低いのでステップ15で送風手段4の送風量は弱とし、移動手段8はOFFで脱臭フィルタ9の通気抵抗を小とし、また複数の光源6の中から波長の長い紫外線を照射する光源6を点灯することで、光触媒の正孔と電子の発生確率を下げ低い臭気レベルに対して効率よく分解できるようにする。

【0091】以上のように本実施例の空気調和機は、室内機1の空気吸い込み口に設置された空気中の臭気レベルを検知する臭気センサーS2と、脱臭運転開始の指令を出す脱臭運転開始手段16と、脱臭能力の自動切替と手動切替を選択する脱臭能力切替手段17と、複数の光源6のON、OFFを制御する点灯制御手段13と、送風手段4の風量を調整するモータ駆動制御手段14と、臭気センサーS2が検知した臭気レベルの信号を受信して脱臭能力を多段階に選択し、点灯制御手段13とモータ駆動制御手段14と移動手段8に対し所定の動作信号を送信する第2のマイクロコンピュータ18とからなる第2の制御装置Cnt 2を備えたものであり、居住者が脱臭運転開始手段16によって脱臭運転を開始し、さらに脱臭能力切替手段17により脱臭能力の自動切替を選択すると、第2のマイクロコンピュータ18は、検知した空気中の臭気レベルの信号を臭気センサーS2から受信し、その臭気レベルのデータをもとに演算処理を行い、最適な脱臭能力を決定する。

【0092】脱臭能力の強、弱に応じてモータ駆動手段14と、移動手段8と、点灯制御手段13に対し所定の動作信号を送信する。

【0093】脱臭能力が強い場合は、速やかに居住空間の臭気成分の除去を行うため送風量を強、通気抵抗を大として臭気成分の捕捉率を向上させ、また複数の光源6を点灯して光触媒3cの分解能力を向上させる。

【0094】脱臭能力弱の場合は、臭気レベルは低いので送風量を弱、通気抵抗を小とし、また複数の光源6の中から波長の長い紫外線を照射する光源6を点灯することで、光触媒3cの正孔と電子の発生確率を下げ低い臭気レベルに対して効率よく分解できるようにする。

【0095】以上のように居住者の好みに応じて脱臭を重視した運転を精度良く効率的に行うことができる。

【0096】また、さらに短い波長の光源6が点灯している際は、空気中の細菌を直接殺菌することもできる。

【0097】(実施例5)図10は、本発明の実施例5による空気調和機の機能ブロック図である。図11は、同実施例の動作を示すフローチャートである。

【0098】Cnt 3は、脱臭運転開始手段16と、タイマー手段19、点灯制御手段13、モータ駆動手段14と、第3のマイクロコンピュータ20とから構成され

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る第3の制御装置である。

【0099】タイマー手段19は、脱臭運転開始手段16からの運転開始の信号を受信すると、脱臭運転時間の計測を開始し、所定時間が経過した後脱臭運転の停止指令を第3のマイクロコンピュータ20に送信する。第3のマイクロコンピュータ20は、タイマー手段19からの脱臭運転の停止指令を受信して、通常の温調運転に復帰させる。また、タイマー手段19は第3のマイクロコンピュータ内の処理装置の一つとして内蔵されていてもよい。

【0100】以上のように構成された空気調和機について、以下その動作を図11のフローチャートをもとにして説明する。

【0101】臭気成分が存在した環境で脱臭能力を優先した運転を行う場合、まずステップ8において、居住者は、運転手段11により室内機1の温調運転を開始する。続いて、ステップ16において、脱臭運転開始手段16により室内機1の脱臭運転開始の信号を送信されると、ステップ17においては、タイマー手段19が脱臭運転時間の計測を開始し、さらにステップ18において、タイマー手段に予め設定されている所定の時間と脱臭運転の実行時間との比較判定も開始する。

【0102】また、第3のマイクロコンピュータは、ステップ17で脱臭運転時間の計測を開始すると同時にモータ駆動手段14、点灯制御手段13、移動手段8に所定の動作信号を送信し、ステップ19において、速やかに居住空間の臭気成分の除去を行うために送風手段4の送風量は強、移動手段8はONで脱臭フィルタ9の通気抵抗は大として臭気成分の捕捉率を向上させ、また複数の光源6を点灯して光触媒3cの分解能力を向上させる。

【0103】さらにステップ17でタイマー手段19が脱臭運転時間が所定の時間を超えたと判定すると、第3のマイクロコンピュータ20に対し脱臭運転の停止信号を送信する。脱臭運転の停止後、ステップ8において第3のマイクロコンピュータは、通常の温調運転を行うように、モータ駆動手段14、点灯制御手段13、移動手段8に所定の動作信号を送信する。

【0104】以上のように本実施例の空気調和機は、脱臭運転開始の指令を出す脱臭運転開始手段16と、脱臭運転開始の信号を受けて脱臭運転時間を計測し、所定時間が経過した後停止の指令を出すタイマー手段19と、複数の光源6のON、OFFを制御する点灯制御手段13と、送風手段4の風量を調整するモータ駆動制御手段14と、タイマー手段19から発信される所定の信号を受信して演算処理し、点灯制御手段13とモータ駆動制御手段14と移動手段8に対し所定の動作信号を送信する第3のマイクロコンピュータ20とからなる第3の制御装置Cn13を備えたものであり、居住者は、脱臭運転開始手段16によって脱臭運転を開始すると、タイマ

ー手段19は運転開始の信号を受けて脱臭運転時間の計測を開始すると共に、第3のマイクロコンピュータ20は、脱臭能力が強となるように動作信号を送信し、送風量を強、通気抵抗を大として臭気成分の捕捉率を向上させ、また複数の光源6を点灯して光触媒3cの分解能力を向上させる。

【0105】タイマー手段19に設定されている所定時間を脱臭運転の実行時間が超えると脱臭運転の停止信号が出され、通常の温調運転に切り替わる。

10 【0106】以上のように効率的な脱臭運転と、センサー等を用いずに脱臭運転の制御を行うことで低コスト化が実現できる。

【0107】また、波長の短い光源を点灯することで空気中の細菌を直接殺菌することもできる。

【0108】

【発明の効果】以上説明したように請求項1に記載の発明は、表面に光触媒を担持した複数のハニカム状吸着材と、接続手段と、移動手段とからなり、前記複数のハニカム状吸着材は、通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材は前記接続手段を介して前記移動手段に連結されており、かつ前記移動手段によって所定距離を他方のハニカム状吸着材の通気面に対し平行に移動できる構造としたことにより、ハニカム状吸着材の通気抵抗の増減を任意に調整することで臭気成分に対する脱臭能力を制御することができる。

【0109】また、請求項2に記載の発明は、室内機内に、熱交換器と、脱臭フィルタと、送風手段と、風向板と、異なる紫外線波長を照射する複数の光源とからなり、前記脱臭フィルタは表面に光触媒を担持した複数のハニカム状吸着材と、前記ハニカム状吸着材と同数の支持手段と、接続手段と、移動手段とからなり、前記複数のハニカム状吸着材は各々支持手段より独立して支持され、かつ通気面同士が平行かつ近接し、少なくとも一つのハニカム状吸着材は前記接続手段を介して前記移動手段に連結されており、かつ前記移動手段により所定距離を支持手段に沿って他方のハニカム状吸着材の通気面に対して平行に移動できる構造を有し、前記複数の光源6は前記脱臭フィルタに紫外光を照射できる位置に設置したことにより、脱臭フィルタの通気抵抗の増減を任意に調整し、また光源の照射波長を任意に調整することで臭気成分に対する脱臭能力を制御することができる。また、波長の短い光源を用いることで空気中の細菌を直接殺菌することもできる。

【0110】また、請求項3に記載の発明は、室内機の空気吸い込み口に設置され、吸い込み空気の色を検知する吸い込み温度センサーと、前記室内機の温調運転のON、OFFの指令を出す運転手段と、温調能力の自動切替と手動切替を選択する温調能力切替手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前

記吸い込み温度センサーが検知した吸い込み空気温度の信号を受信して温調能力を多段階に選択し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第1のマイクロコンピュータとからなる第1の制御装置を備えたことにより、居住者が温調能力切替手段により温調能力の自動切替を選択すると、前記第1のマイクロコンピュータは、検知した吸い込み温度の信号を前記吸い込み温度センサーから受信し、その温度データをもとに演算処理を行い、多段階に温調能力を決定する。

【0111】温調能力の強、弱に応じて前記モータ駆動手段と、前記移動手段と、前記点灯制御手段に対し所定の動作信号を送信する。温調能力が強い場合は、速やかに居住空間を快適な温度にするため送風量を強、通気抵抗を小とし、また脱臭を行うため複数の光源を点灯して光触媒の分解能力を向上させる。温調能力弱の場合は、居住空間の温度面での快適性は確保されているので送風量を弱とし、また流入空気量が少ない分臭気成分を効率よく脱臭するために、通気抵抗を大として接触確率を向上させ、さらに複数の光源を点灯することで、光触媒の分解能力を向上させるので快適性を優先しながら脱臭能力も確保できる。

【0112】また、短い波長の光源により空気中の細菌を直接殺菌することもできる。

【0113】また、請求項4に記載の発明は、請求項2に記載の発明において、前記室内機の空気吸い込み口に設置された空気中の臭気レベルを検知する臭気センサーと、脱臭運転開始の指令を出す脱臭運転開始手段と、脱臭能力の自動切替と手動切替を選択する脱臭能力切替手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記臭気センサーが検知した臭気レベルの信号を受信して脱臭能力を多段階に選択し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第2のマイクロコンピュータとからなる第2の制御装置を備えたことにより、居住者が前記脱臭運転開始手段によって脱臭運転を開始し、さらに脱臭能力切替手段により脱臭能力の自動切替を選択すると、前記第2のマイクロコンピュータは、検知した空気中の臭気レベルの信号を前記臭気センサーから受信し、その臭気レベルのデータをもとに演算処理を行い、最適な脱臭能力を決定する。

【0114】脱臭能力の強、弱に応じて前記モータ駆動手段と、前記移動手段と、前記点灯制御手段に対し所定の動作信号を送信する。脱臭能力が強い場合は、速やかに居住空間の臭気成分の除去を行うため送風量を強、通気抵抗を大として臭気成分の捕捉率を向上させ、また複数の光源を点灯して光触媒の分解能力を向上させる。脱臭能力弱の場合は、臭気レベルは低いので送風量を弱、通気抵抗を小とし、また複数の光源の中から波長の長い

紫外線を照射する光源を点灯することで、光触媒の正孔と電子の発生確率を下げ低い臭気レベルに対して効率よく分解できるようにする。以上のように居住者の好みに応じて精度の良い効率的な脱臭運転を実現できる。

【0115】また、さらに短い波長の光源が点灯している際は、空気中の細菌を直接殺菌することもできる。

【0116】また、請求項5に記載の発明は、請求項2に記載の発明において、脱臭運転開始の指令を出す脱臭運転開始手段と、脱臭運転開始の信号を受けて脱臭運転時間を計測し、所定時間が経過した後停止の指令を出すタイマー手段と、前記複数の光源のON、OFFを制御する点灯制御手段と、前記送風手段の風量を調整するモータ駆動制御手段と、前記タイマー手段から発信される所定の信号を受信して演算処理し、前記点灯制御手段とモータ駆動制御手段と前記移動手段に対し所定の動作信号を送信する第3のマイクロコンピュータとからなる第3の制御装置を備えたことにより、居住者は、前記脱臭運転開始手段によって脱臭運転を開始すると、タイマー手段は運転開始の信号を受けて脱臭運転時間の計測を開始すると共に、第3のマイクロコンピュータは、脱臭能力が強いように動作信号を送信し、送風量を強、通気抵抗を大として臭気成分の捕捉率を向上させ、また複数の光源を点灯して光触媒の分解能力を向上させる。

【0117】タイマー手段に設定されている所定時間が脱臭運転の実行時間が超えると脱臭運転の停止信号が出され、通常の温調運転に切り替わる。以上のように効率的な脱臭運転と、センサー等を用いずに脱臭運転の制御を行うことで低コスト化が実現できる。

【0118】また、波長の短い光源を点灯することで空気中の細菌を直接殺菌することもできる。

【図面の簡単な説明】

【図1】本発明による実施例1の脱臭フィルタの正面図

【図2】同実施例の脱臭フィルタの通気抵抗を増加させた場合の正面図

【図3】本発明による実施例2の空気調和機の室内機の断面図

【図4】同実施例による脱臭フィルタの正面図

【図5】同実施例の脱臭フィルタの通気抵抗を増加させた場合の正面図

【図6】本発明による実施例3の空気調和機の機能ブロック図

【図7】同実施例の空気調和機の動作を示すフローチャート

【図8】本発明による実施例4の空気調和機の機能ブロック図

【図9】同実施例の空気調和機の動作を示すフローチャート

【図10】本発明による実施例5の空気調和機の機能ブロック図

【図11】同実施例の空気調和機の動作を示すフローチャート

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【図12】従来の空調機の室内機の断面図

【図13】従来の脱臭フィルタの正面図

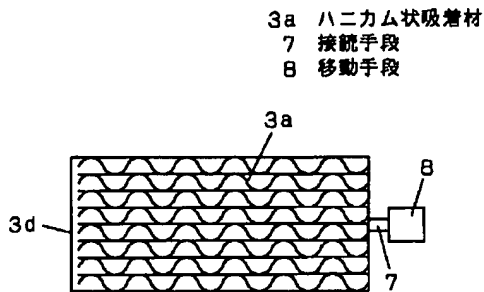
【図14】従来の脱臭フィルタの脱臭機能を発現させる部位の拡大断面図

【符号の説明】

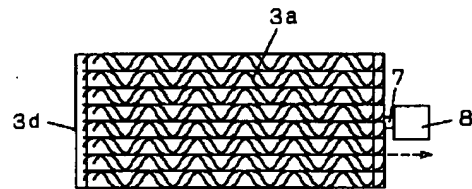
- 1 室内機
- 2 熱交換器
- 3a ハニカム状吸着材
- 3c 光触媒
- 4 送風手段
- 5 風向板
- 6 光源
- 7 接続手段
- 8 移動手段
- 9 脱臭フィルタ

- 10 支持手段
- 11 運転手段
- 12 運転能力切替手段
- 13 点灯制御手段
- 14 モータ駆動制御手段
- 15 第1のマイクロコンピュータ
- 16 脱臭運転開始手段
- 17 脱臭能力切替手段
- 18 第2のマイクロコンピュータ
- 10 19 タイマー手段
- 20 第3のマイクロコンピュータ
- S1 吸い込み温度センサー
- S2 臭気センサー
- Cnt1 第1の制御装置
- Cnt2 第2の制御装置
- Cnt3 第3の制御装置

【図1】

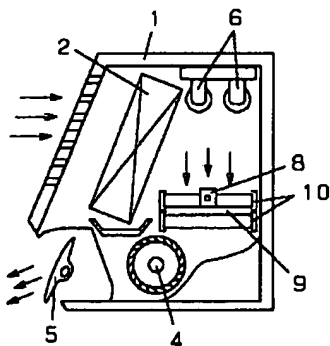


【図2】



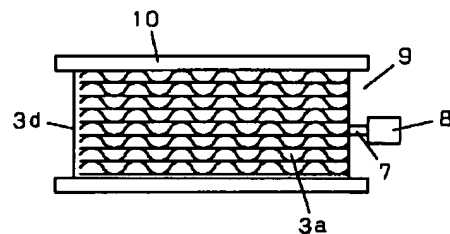
【図3】

- 1 室内機
- 2 熱交換器
- 4 送風手段
- 5 風向板
- 6 光源
- 8 移動手段
- 9 脱臭フィルタ
- 10 支持手段

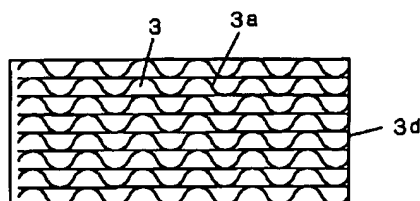


【図4】

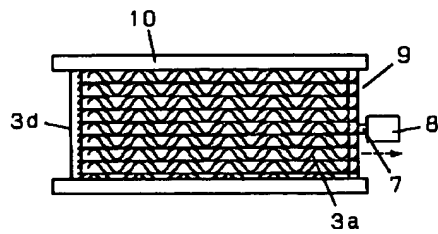
- 3a ハニカム状吸着材
- 7 接続手段
- 8 移動手段
- 10 支持手段



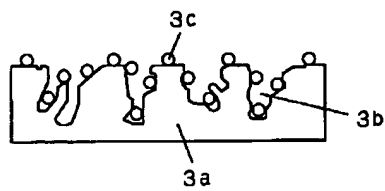
【図13】



【図5】

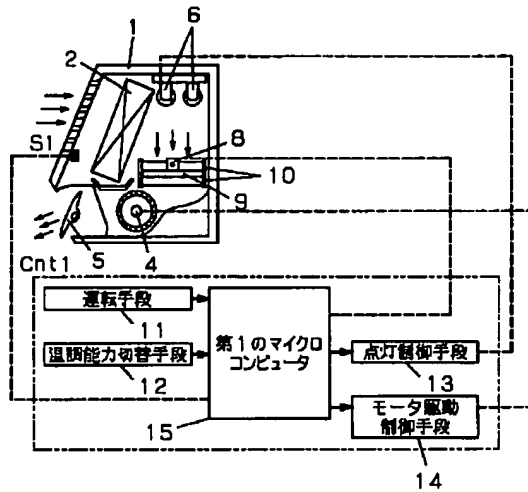


【図14】



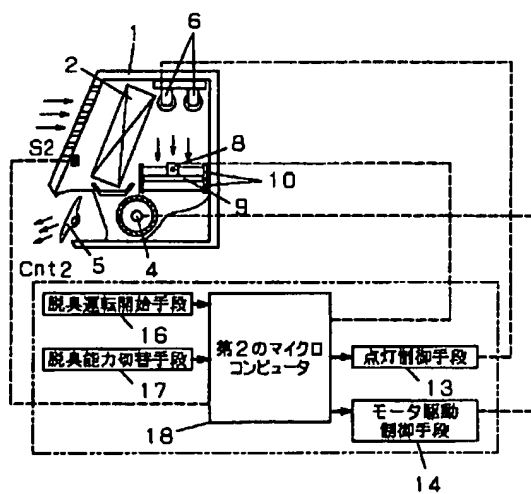
【図6】

S1 吸い込み温度センサー
Cnt1 第1の制御装置



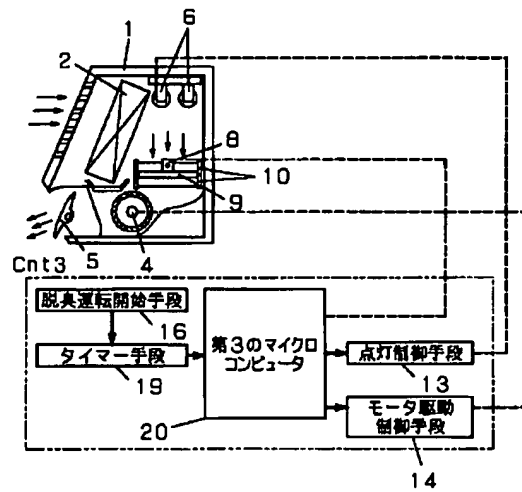
【図8】

S2 臭気センサー
Cnt2 第2の制御装置

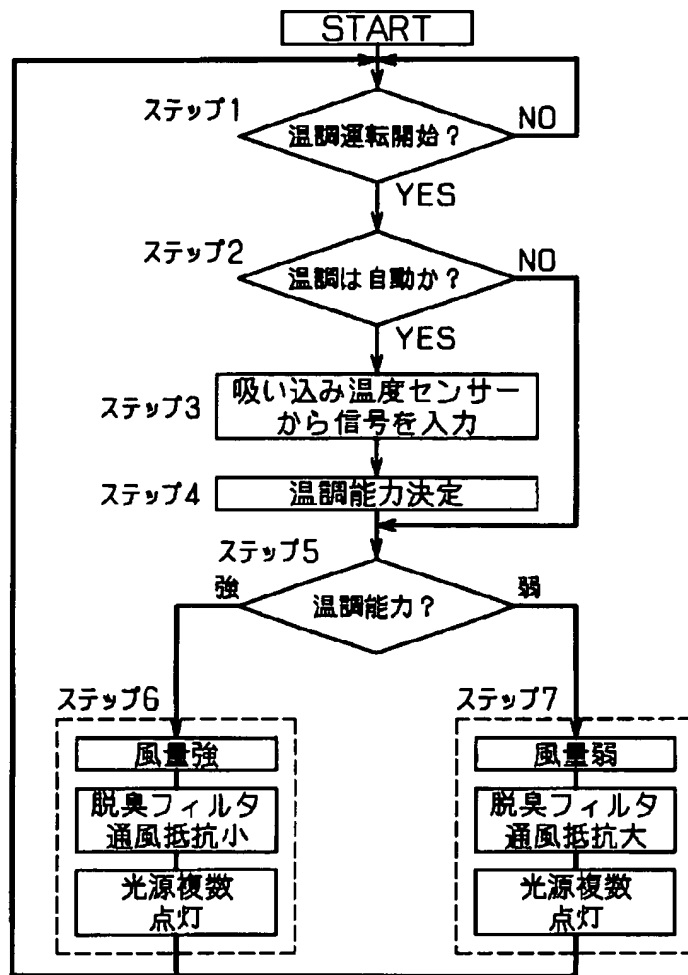


【図10】

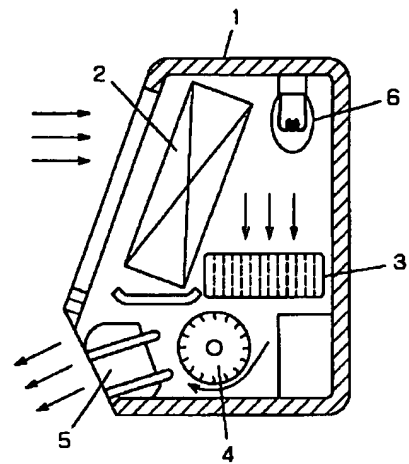
Cnt3 第3の制御装置



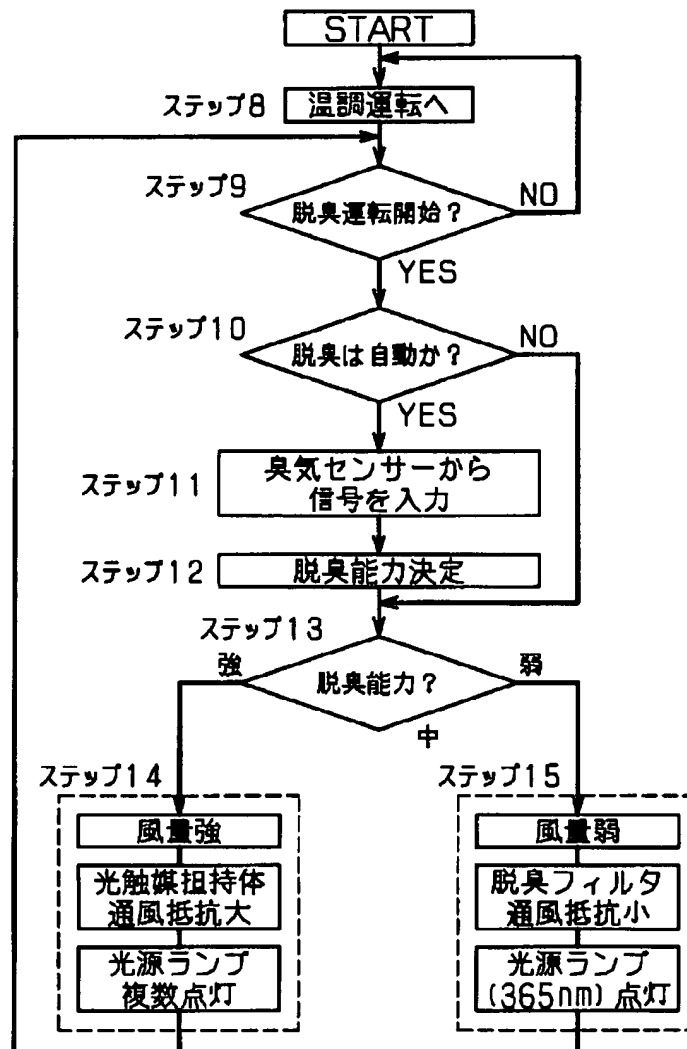
【図7】



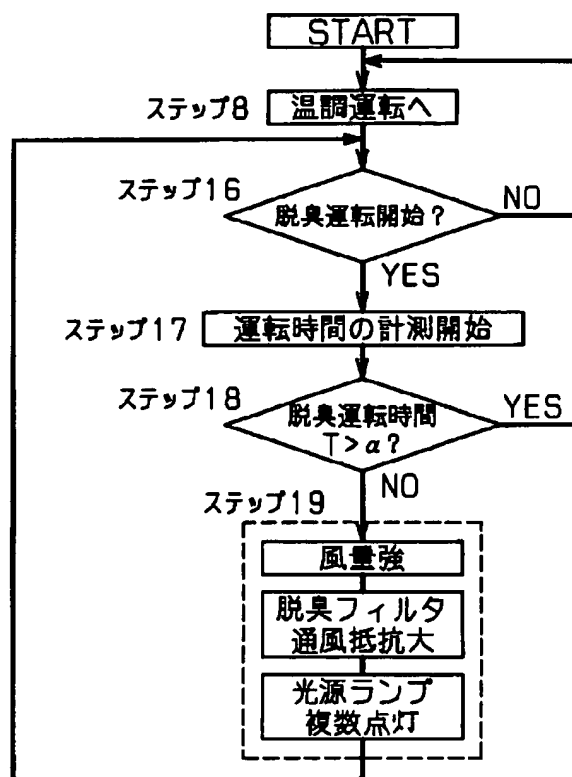
【図12】



【図9】



【図11】



フロントページの続き

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 CF04 CF10 CG01 CH05 CK01